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Organization, Management and An Accounting System for An Architect's Office

By H. P. VAN ARSDALL, *of Samuel Hannaford & Sons, Architects, Cincinnati, Ohio*

INTRODUCTION:

THE average architect, like the average doctor or lawyer, enjoys only a moderate income from his professional practice and his accumulations after the normal term of activity provide, at best, only a very modest competency.

In the writer's opinion the reason for this condition is to be found in their general indifference to the commercial side of the profession.

The practice of architecture, while very properly classed as professional in the same degree as the practice of law or medicine, is unlike others, distinctly commercial in its methods of achieving results. It is doubtless true that the creative faculty leaves little opportunity for the successful development of purely commercial functions, but since existence depends on income, there seems no valid excuse for inefficiency in management of the business end.

Architecture, as a business, has as definite an output as a factory, namely buildings, and as an intermediate process, plans and specifications.

Architects, as a rule, are liberal in their investment in literature, plates and technical information, but suggestions looking to improvement and modernization in methods of production and accounting are too frequently dismissed with little consideration for fear of reducing the office to a purely industrial level, with a consequent loss of caste—by the office force. This attitude and its correlative inefficiency is frequently a surprising revelation to clients affiliated with well organized industries and indicates an inexcusable ignorance of fundamental business principles on the part of those assuming it.

Few architects seem either to understand, or to utilize any rational system of cost accounting and, as long as they have a balance in bank, appear indifferent to the matter. In fact, very few have any adequate idea of the cost of producing a set of plans and specifications. The writer recently asked three prominent architects, all working under practically the same conditions, as to their average rate of overhead expense. One of them replied "40 per cent. of the draftsmen time," one "56 per cent. of the draftsmen time," the third man did not know and was not interested. The head of a factory would think such ignorance imbecile, for he knows that only the Grace of God prevents bankruptcy of any concern which does not know the cost of production for the commodity sold.

It happens often that plans and specifications are prepared for a building and after bids are received the whole project is abandoned. The architect then wonders, notwithstanding the fact that the American Institute of Architects has laid down a schedule of charges, what he will get out of it or how much he should charge. Nine out of ten don't know what to charge, but make a rank guess and send out a bill. If the client objects to the amount of the bill, the architect usually has no cost records to back up his claim and under the conditions has to make the best settlement possible.

The installation of improved methods in office management and accounting cannot be accomplished in a day. It requires considerable time, labor and thought, but once installed, all friction and duplication is avoided and the organization operates like a well balanced machine.

This article was written for the sole purpose of pointing out the vital necessity of modern methods, with some suggestions looking toward improvement in a commercial sense.

ORGANIZATION:

Organization has been defined as the collecting together of individuals for the purpose of producing certain things, and the division of authority among these individuals in order that they may perform their special functions harmoniously and efficiently for the common good of all.

There are three principal forms of organization

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that may be used; viz., individual proprietorship, partnership, corporate.

INDIVIDUAL PROPRIETORSHIP:

Individual ownership is the simplest form in which business can be conducted and is best suited where the amount of capital required is small and the business risk is slight. An individual may select his own time to start operating and can retire at will, providing all obligations have been met. Since all responsibility and authority is vested in one person, matters of importance that require quick decisions can be settled promptly; whereas with the other forms of organization, more time is required, as questions of vital importance are usually referred to two or more persons. This form has many disadvantages; the most conspicuous of these is limited capital, and a single mind to pass judgment on important matters. Quick action often leads to serious results. It is only in rare instances where you find a combination of keen business judgment and designing skill in one person. It has been demonstrated to the writer time and again that the strictly architectural designing mind abhors matters pertaining of finance and business. This type is eager to offer suggestions and advice, but shifts responsibility when results are bad.

This form of ownership cannot be recommended, except in the smallest of offices.

PARTNERSHIP:

A partnership may be described as an association of two or more competent persons for the purpose of combining capital, labor and skill in the prosecution of some lawful business for profit.

Our laws grant the right to any two legally responsible parties to enter into this arrangement of business organization.

Each partner is an agent of the firm, and when acting in the interest of or for the partnership can legally bind the other members to any agreement entered into.

In the case of partnership debts each firm member is liable for the full amount.

The partnership permits of a division of authority, which is very essential in any business. Usually in forming a partnership one member is of the executive type and the other man of designing ability. The executive should be familiar with good business practice and management and have a thorough knowledge of architecture; the other member or members have charge of the drafting room and the actual supervision of building construction.

This form of organization lends itself more readily to the architectural business than any other, and where harmony is secured it is the most desirable and profitable.

In the forming of a partnership the following points should be written in the articles of co-partnership: (1) The names of the contracting parties; (2) the firm name; (3) the purpose for which the partnership is formed; (4) the invested capital of each partner and the division of profits and losses; (5) the system of accounting; (6) the method of conducting business; (7) the privileges and rights of the partners; (8) the dissolution of the partnership.

CORPORATION:

Blackstone defines a corporation as "An artificial person created for preserving in perpetual succession certain rights which being conferred on natural persons only would fail in the process of time."

A corporation is a "legal entity" and has its origin under the laws of some state. Its powers are all conferred by the state under which it is organized.

It can own property in its own name, can sue and be sued; whereas a partnership can do neither. It is financed by the sale of stock or shares of equal value to individuals, and the individual's voice in the operation of the company is governed by the amount of stock held.

Since the services of an architect are strictly professional, and constitute a personal service, it can readily be seen that the removal of one of the principal units of the organization would destroy the foundation that your whole business is built upon.

It is therefore recommended that this form of organization be not considered.

MANAGEMENT:

The life of any business depends upon its management. It should therefore be organized in an orderly and systematic fashion, purposed to gain maximum production at a minimum cost. This result cannot be obtained indirectly; direct methods must be employed. Thought spent in planning your working arrangement will prove to be valuable, as it will produce harmony among your forces and at the same time increase production.

Clearly define authority and responsibility among subordinates to insure the successful co-operation of divided effort.

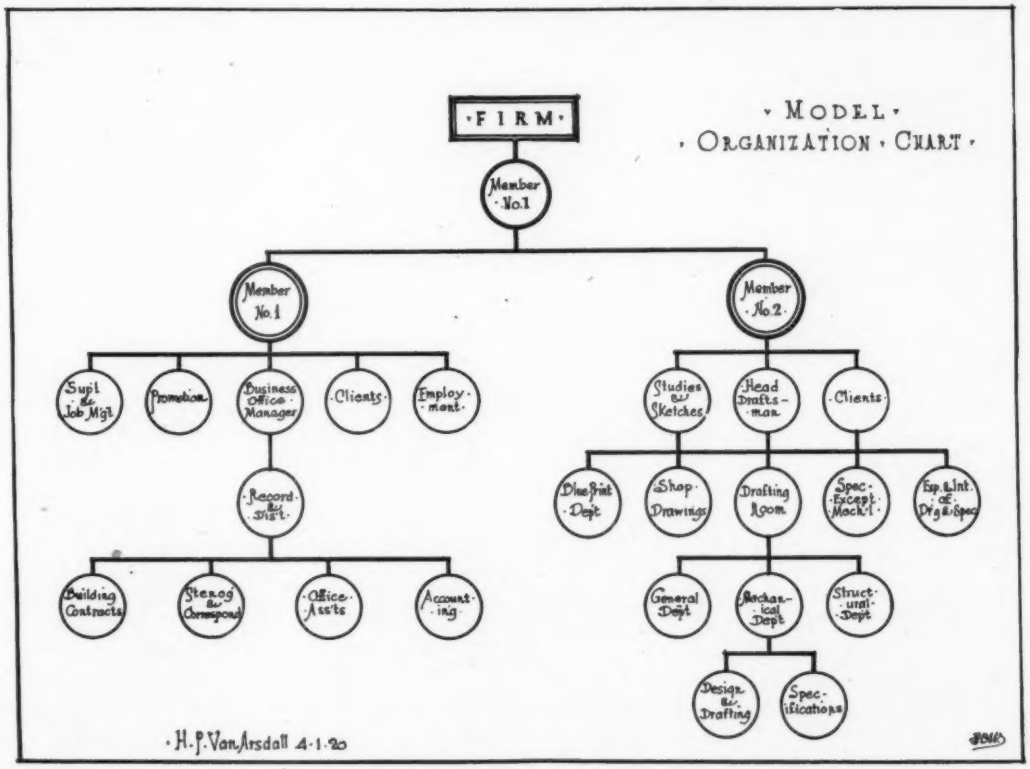
In many offices the old moss-eaten idea of never increasing a man's wages until he asks for it still prevails. Draftsmen and office help should not be placed in this embarrassing position. It is humiliating to ask for a "raise." An executive should quickly reward good service, as it encourages a man more than anything else. A haphazard method of increasing salaries creates dissatisfaction among employees and kills ambition.

It is a good practice (during normal times) for a firm to fix upon a just schedule of wages, and in-

form the employees that through meritorious work their wages will be increased in accordance with their efficiency records, and then go through with it.

In order to have a definite working arrangement the organization chart should be used, which clearly defines authority.

An organization chart is simple and readily understood. No one is laboring with a false idea of his position.



The model chart presented is a suggestive arrangement that will go far toward effecting an efficient working force.

DESCRIPTION OF CHARTS

Firm: The firm is represented by the rectangle.

Senior Member No. 1: Is the executive member of the firm who directs the business policy, solicits business, makes contracts, interviews clients, and exerts a general supervision over the entire office.

RIGHT BRANCH OF CHART:

Member No. 2: Is the firm member having charge of the production end of the business. It is customary to divide his work into three sections.

1.—*Studies, Sketches and Interior Decorations*: The preparation of all studies, sketches and water color drawings is done in this section. Approximate estimates of cost are also made.

2.—*Clients*: In the preparation of sketches, etc., it is necessary that consultations be had with the client. In this connection it is suggested that the head draftsman sit in these conferences and take notes of all question discussed. After the conference a letter giving in detail the results of the discussion should be sent to the client and a copy retained in the office for reference. This procedure silences all future argument as to what was agreed upon.

3.—*Head Draftsman*: The head draftsman is directly responsible to the head of this department. All instructions from the head of the department to any subordinate department must pass through the head draftsman. In this way he is in constant touch with all work in the office. All questions concerning the work in divisions below shall be brought to the head draftsman, and his decision shall be final, except where, in his judgment, the matter should be submitted to the head of the department. In the submission of matters to the head of the department a convenient and regular time should be selected.

It can be seen that this arrangement will relieve

member No. 2 of much detail and routine work and will allow him to devote his time to more pressing matters.

The head draftsman divides his work into four departments:

(*a*) *Shop Drawings*: On the submission of shop drawings by a contractor the head draftsman looks them over and has them checked by the regular checker or by the draftsman that is most familiar with the work. After the drawings are checked, corrected and approved he sees that they are returned and proper distribution made to the parties requiring them, together with any written instructions. A copy should be kept for the office file.

(*b*) *Specifications*: The writing of specifications is one of the most important branches of work and should be done by one specially fitted for it. All specifications (except those in connection with the mechanical department) are prepared in this department.

(*c*) *Explanation and Interpretation of Drawings and Specifications*: It is desirable and advisable that this be done by the head draftsman. It happens so often, in many offices, that a contractor, when bidding on work, asks questions regarding the meaning and intent of certain things in the drawings and specifications; usually the question is put to the first person seen, and he answers it in his own way. Then the same performance is gone through with some one else, and consequently a multitude of answers have been given, with no one responsible for them. The head draftsman should answer all questions and keep a record of questions and answers.

(*d*) *Drafting Room*: The drafting room is under the supervision and control of the head draftsman. Member No. 2 looks to him for its efficient and successful operation.

Every man in the drafting room should be instructed as to his duties and understand and recognize the position of other draftsmen.

In most drafting rooms considerable waste occurs through the careless handling of tracing cloth, paper and pencils. A saving in these materials can be effected by keeping them under lock and key and have one person issue supplies.

A list of standard size sheets for tracing cloth should be made, and when the office boy is not busy sheets can be cut to size and placed in a drawer ready for use.

A proper filing system for the filing of drawings, specifications, shop drawings, photographs of finished buildings, and catalogues should be worked out. There are many systems now in use. A system of filing, familiar to the writer and one that has proven fairly good, is handled in the following manner: Drawings are filed, in a vault, flat on shelves 40 by 50 inches, a space of 2 inches is left between, and a card with the name of the job is tacked on the edge of the shelf. On completion of the building, drawings, specifications, details and shop drawings are rolled up together in one bundle and filed in the store room. Specifications are filed in folders in a vertical letter file. Shop drawings are filed the same as tracings.

Photographs of finished buildings are made with linen backs, size 7 by 10 inches, with a 2-inch binder edge for inserting in a loose leaf binder. Photographs are of great value in interesting clients.

Catalogues are the ost difficult to file and the greatest source of trouble in the office. A very good solution of this problem is to file them in a vertical letter file, in folders, and classify them as "electric supplies," "plumbing supplies," "tile," "roofing," etc. Heavy and large catalogues are placed on shelves.

The drafting room organization is divided into three departments: General, Structural and Mechanical.

(*a*) *General*: This department is charged with the production of all drawings, details, etc., and the embodying in the general drawings of all the work of other departments necessary to make same complete.

When drawings and specifications are completed, checked, numbered and signed (see Drawing Record Book page), they are delivered to the business office manager, who secures the necessary bids.

(*b*) *Structural*: This department does all designing and drawing for structural work, principally steel and concrete. The department is composed of a structural engineer, with assistants from the drafting room, as the work in hand requires.

(*c*) *Mechanical*: This department is in charge of a mechanical engineer, with such assistants as are necessary.

All work of a mechanical nature, such as heating, ventilating, power piping, plumbing, elevators and electrical work coming into the office, is handled by this department and the mechanical engineer is responsible for the production of all drawings, specifications, etc., required.

It might be well to suggest before concluding the description of this department that the drafting room should be located with the general offices in a modern, easily accessible office building. The offices should be well lighted and ventilated and properly furnished in keeping with the profession. It is depressing for a man to work in poor surroundings, all good inspirations die quickly and lack of interest is manifested. Equipment should be of the best and every man provided with proper tools. Dull tools produce a like product.

LEFT BRANCH OF CHARTS:

Firm Member No. 1.—This member is in direct charge of the left branch of the chart, and includes the Business office, Job Management and Superintending of Construction, Promotion of Building Projects, Interviewing Clients and Employment of all help.

SUPERINTENDENT:

The Superintendent of Construction has complete charge of all building construction, management of jobs, the making of monthly estimates for the purpose of paying contractors and supervises the work of all inspectors who are actively engaged on one job.

It is the duty of the Superintendent to make regular weekly reports, stating in detail the progress of the work. For each job a report is sent to the client. These reports, on completion of the building, show a history of the entire operation, from the breaking of ground to the occupancy of the building.

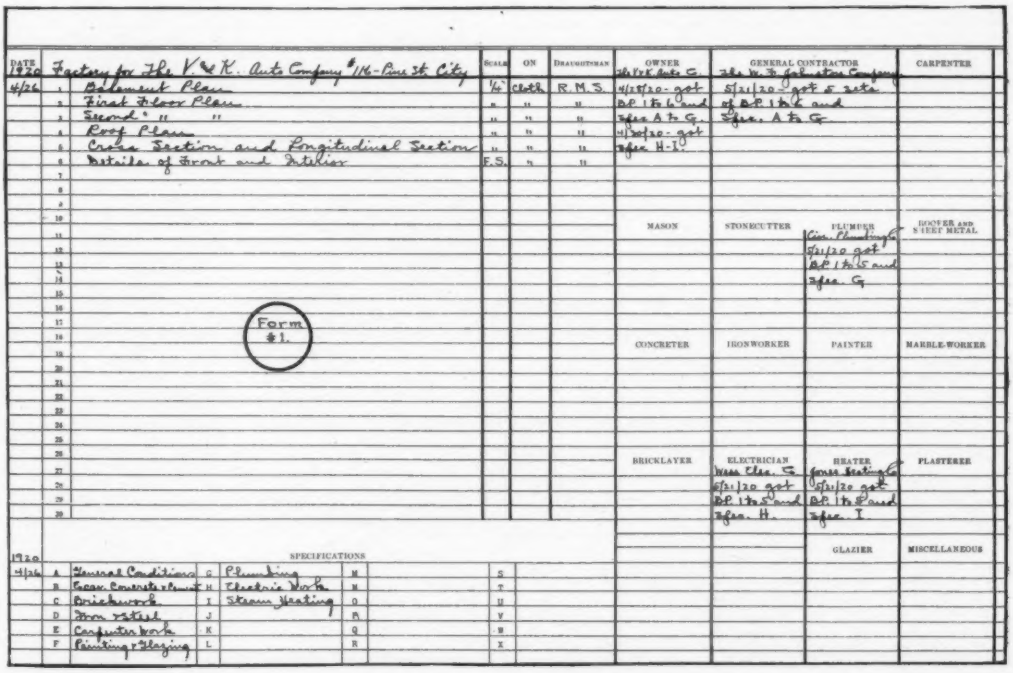
WAITING ROOM:

The waiting room is in charge of a young lady. It is her duty first of all to be courteous to everyone. When a person enters the office she has him state his name and mission; if she can answer his questions satisfactorily the party is sent away without disturbing the office, if not, the proper person is called.

FILING:

The careful filing of documents, letters, etc., is highly essential.

For letters any standard vertical file case may be used, preferably metal. The drawers of these cases measure approximately 12 inches by 11 inches, are 3 feet deep and have alphabetical indexes. All correspondence relating to a building may be filed by number or name in separate folders made for this purpose. All letters of any one job are placed in a single folder, and where the job is of any magnitude the correspondence may be divided up into separate



BUSINESS OFFICE:

The Business Office Manager has charge of all records, documents, books, routine correspondence, securing of bids, writing contracts and bonds, issuing certificates of payment to contractors, and the handling of all financial matters. He also supervises the work of stenographers, the accounting department, office assistants, and looks after the general welfare of the office.

folders for each branch of work. Miscellaneous correspondence is filed in alphabetical order, in separate folders.

A Record Book, alphabetically arranged, should be kept, showing the cost of every building erected, together with the cost per cubic foot complete, and the cost per cubic foot without heating and mechanical equipment, furnishings, etc.

Documents such as contracts, bids, accepted prop-

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ositions, etc., are filed in reversible folders and placed in standard document file cases.

Superintendent's reports are filed in separate folders in a small file case.

Six months after completion and acceptance by the owner of a building all documents, superintendent's reports and letters, are placed in the transfer case.

BUILDING CONTRACT RECORDS:

Two books are necessary. A Contract Book (see typical page, for No. 5) and a Contract Ledger (see typical page, form No. 6).

When contracts for a building are awarded the name of the owner and the location of the building are entered on the top line of a page in the Contract Book. The name and location are also written in the index, with the page number for ready reference. Just below the double line insert the following:

Cubic contents of building.

Cost of building complete.

Cost of building without mechanical equipment, fixtures, etc.

Cost per cubic foot complete.

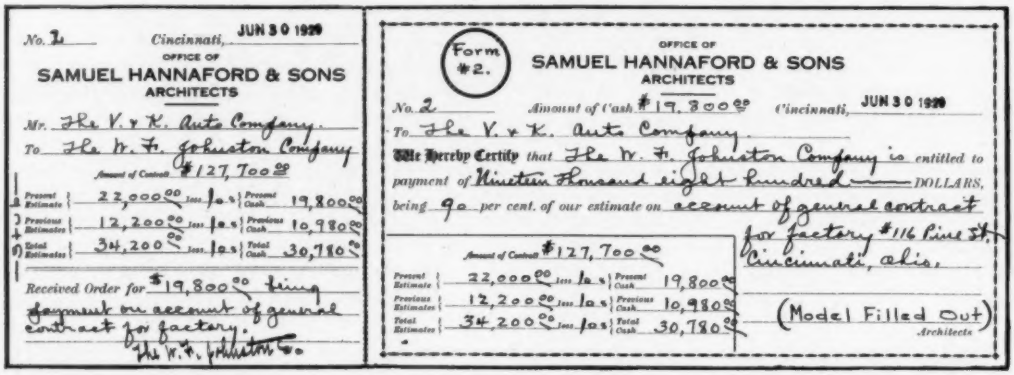
Cost per cubic foot without mechanical equipment, fixtures, etc.

The above figures cannot be finally determined until the building is completed.

Dropping down at least two lines we insert the contract, as follows:

Beginning on the left hand side of the page, place the date, the contract, the name of contractor, and in the ruled column the amount of contract. The second ruled column is used for the page number in the Contract Ledger. Where a contract is small and only one or two payments will likely be made before it is competed entries of payment are placed in this space. In the case of a large contract, where many payments will be made before the work is completed, it is transferred to the Contract Ledger.

The Contract Ledger page, as you will note, is constructed with the standard ruling. The name of the owner and the name of the contractor are written at the top of the page. On the credit or right side of the page is written the date, contract and amount. The left side of the page is for the purpose of entering payments. This system of keeping contract records is very simple, and at the same time efficient, no matter how large the operation.



No. 1 Cincinnati, JUN 30 1920

OFFICE OF
SAMUEL HANNAFORD & SONS
ARCHITECTS

Mr. The V. & K. Auto Company.
To The W. F. Johnston Company
Amount of Contract $127,700.00

Present Estimate	22,000.00	less 10 %	Present Cash	19,800.00
Previous Estimates	12,200.00	less 10 %	Previous Cash	10,980.00
Total Estimates	34,200.00	less 10 %	Total Cash	30,780.00

Received Order for $19,800.00 being payment on account of general contract for factory.
The W. F. Johnston Co.

Form #2.

OFFICE OF
SAMUEL HANNAFORD & SONS
ARCHITECTS

No. 2 Amount of Cash $19,800.00 Cincinnati, JUN 30 1920

To The V. & K. Auto Company.

We Hereby Certify that The W. F. Johnston Company is entitled to payment of Nineteen Thousand eight hundred ——— DOLLARS, being 90 per cent. of our estimate on account of general contract for factory #116 Pine St. Cincinnati, Ohio.

Amount of Contract $127,700.00

Present Estimate	22,000.00	less 10 %	Present Cash	19,800.00
Previous Estimates	12,200.00	less 10 %	Previous Cash	10,980.00
Total Estimates	34,200.00	less 10 %	Total Cash	30,780.00

(Model Filled Out)
Architects

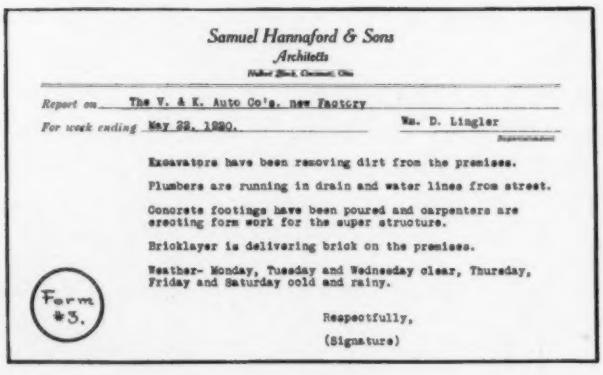
Stenographer's note books, when filled, are filed away chronologically.

STANDARD FORMS:

It is desirable that every office have a complete set of Standard Forms, including large and small size Envelopes and Letterheads, Contracts, Bonds, Superintendent's Reports, Time Cards, Extra Orders, Certificates, etc. By standardizing the various forms it eliminates the necessity of working out something new every time an order is given for printing. The following forms are shown: No. 1, Drawing & Specification Record Book; No. 2, Certificate for Payment; No. 3, Superintendent's Report; No. 4, Extra Order.

ACCOUNTING SYSTEM.

This department keeps a record of all contracts for the various building operations and all firm financial books.



Samuel Hannaford & Sons
Architects
Walnut Block, Cincinnati, Ohio

Report on The V. & K. Auto Co's. new Factory
For week ending May 22, 1920. Wm. D. Lingler
Superintendent

Excavators have been removing dirt from the premises.

Plumbers are running in drain and water lines from street.

Concrete footings have been poured and carpenters are erecting form work for the super structure.

Bricklayer is delivering brick on the premises.

Weather- Monday, Tuesday and Wednesday clear, Thursday, Friday and Saturday cold and rainy.

Form #3.

Respectfully,
(Signature)

Factory for The V. and K. Auto Company.
#116 - Pine street - Cincinnati, Ohio.

1920

Total Cost of Building
Total Cubic Contents 601520 cu. ft.
Cost ____ cts. for cubic foot complete.
Cost ____ cts. " " " without equipment, etc.

Form #5.

Apr	28	General Contract - Including Excavating, Concrete & Cement, Brickwork, Iron & Steel Work, Carpenter Work, Painting & Glazing	The W. F. Johnston Co.	127700 —		518
		Plumbing	Cincinnati Plumbing Co.	5620 —		518
		Electric Work	Wess Electric Co.	4220 —	Pd. 5-30-20 $2000	
		Steam Heating	Jones Heating Co.	8640 —		
May	12	Extra Order #1 - see below.				
		50 cu. yds. excav. - 100 00 40 " " conc. - 800 00 900 00	The W. F. Johnston Co.	900 —		518

The V. & K. Auto Company and The W. F. Johnston Co.

1920

May	30	Cash Voucher		10980 —	Apr	28	General Contract	360		127700 —
June	30	" "		19800 —	May	12	Extra Order #1			900 —

The V & K. Auto Company and Cincinnati Plumbing Co.

1920

					Apr	28	Plumbing	360		5620 —

FORMS 5 AND 6, ACCOUNTING SYSTEMS FOR AN ARCHITECT'S OFFICE

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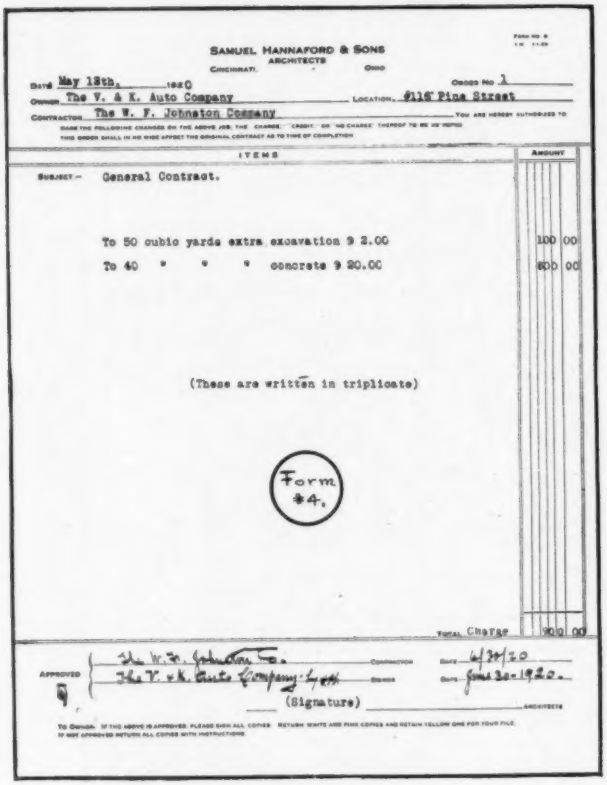

SAMUEL HANNAFORD & SONS
ARCHITECTS
CINCINNATI, OHIO

Date May 18th, 1920 Order No 1
Owner The V. & K. Auto Company Location, #116 Pine Street
Contractor The W. F. Johnston Company You are hereby authorized to

ITEMS	AMOUNT
Subject:- General Contract.	
To 50 cubic yards extra excavation @ 2.00	100 00
To 40 " " " concrete @ 20.00	800 00
(These are written in triplicate)	
Form #4.	
Total Charge	900 00

APPROVED { The W. F. Johnston Co. Contractor Date 4/20/20
The V. & K. Auto Company: by Owner Date June 20-1920.
(Signature) Architects

To Owner. If this above is approved, please sign all copies. Return white and pink copies and retain yellow one for your file. If not approved return all copies with instructions.

Omissions and credits are entered with red ink.

Entries of payments to these books are made from the certificate stubs in certificate book (see Form No. 2).

(To be Continued)

Outlook for Building

There will be no substantial relief from the housing and renting crisis from which New York suffers for at least two years yet, while the building shortage in the city cannot be fully made up until 1927, according to a booklet just issued by the New Business Department of the American Trust Company, Broadway and Cedar street.

This booklet, which was prepared by W. Burke Harmon, real estate expert, consists of a careful study of the housing situation, as indicated by past records, from 1914 to date, and as forecasted by probable developments from now until 1928.

The shortage in housing at the end of each year, measured by the gradually depreciating dollar, has been studied and conclusions reached that the present housing shortage is $660,000,000, and that the maximum will be reached in 1923, with a deficit of $960,000,000, whereupon the shortage will gradually begin to decrease and will continue to decrease until the normal condition is resumed in 1927.

Figured from the point of view of its purchasing power as measured by cubic feet of construction, the value of the dollar, assumed to be normal in 1914, is now reduced to 50 cents, and Mr. Harmon concludes that the dollar will begin to increase in its purchasing power in 1922, or, in other words, construction prices will begin to fall materially next year.

Building Progress in New York

The report of the Manhattan Bureau of Buildings for the six months ending June 30, as compiled by Superintendent Rudolph P. Miller, shows that plans were filed for the construction of 434 new buildings costing a total of $67,382,458, as against 182, costing $24,-034,468 during the same period last year. Plans were filed for ten dwellings, fifteen tenements, two hotels, twenty-eight store and loft buildings, forty-eight office buildings, sixteen factories and workshops, three schoolhouses, one church, one municipal building, eleven places of amusement, six hospitals, 269 stables and garages and twenty-four other structures.

The report also shows that applications were made for alterations to 2,395 buildings, at an estimated cost of $23,704,908, for the first six months this year, as against 1,825 alteration plans costing $11,192,156, during the same period last year.

For the month of June the report shows that plans were filed for the construction of 104 new buildings costing $8,447,500, as against forty-two buildings, costing $10,700,286, for the same month in 1919.

Colossal Statue Completed

Lorado Taft's "Fountain of Time," the largest piece of sculpture in Chicago, has been completed and set up in Washington Park fronting the Midway. It is now in plaster, done at a cost of $50,000. If it meets with approval and it is decided to give it permanent form in bronze its further cost will be around $250,000.

Mr. Taft, who is one of the best known sculptors in the west, began working on his monumental work in 1913. He was commissioned by the B. E. Ferguson Fund, of which the Art Institute is the trustee, and which has already given several notable pieces of sculpture to the city.

The group depicts Father Time, a colossal statue, watching the procession of humanity file by.

Architectural Quicksands

Part II

By CLINTON H. BLAKE, JR., *of the New York and Federal Bars*

IT must be remembered that from the point of view of the client the building of a house is primarily a business undertaking, and his relations with the contractor and architect alike are business relations purely. He employs the architect, it is true, as an expert trained to give him both a pleasing result and a house suited to his particular requirements, but he nevertheless regards, and quite properly regards, his relations with the architect as business relations in the sense that the professional relationship involved is upon an ordinary business basis. The client does not resent, and rather welcomes, the desire of the contractor to have everything clearly understood before the work is undertaken, and there is every reason why he should welcome a similar attitude and desire on the part of his architect. If a customer desires to buy some commercial product, he will wish to know the terms upon which it will be sold; if he desires a portrait painted, he will wish to know how much the artist will charge for painting it. So, if a client desires to have plans prepared for a country home and to have the erection of the house superintended by a trained architect, there is every reason in common sense why he should prefer to know the basis upon which the architect will charge and the other terms and conditions, both as respects the rights of the architect and his own rights, upon which the work will be undertaken and carried to completion. I am glad to say that there has recently been evident an increasing and very gratifying tendency on the part of architects to appreciate the fact that this is so and to exercise a much greater degree of care in arriving at a fair and full understanding before undertaking the work.

The Contract Between Client and Architect

ONE of my clients has adopted a rather ingenious compromise, which, while not as effective as the making of a proper contract with the client, is nevertheless interesting. He has printed a small and rather informal-appearing schedule of his charges in general terms based largely upon the schedule of charges of the American Institute and of the New York Chapter, and headed, "Practice and Charges of (name of the architect)." When a client calls and asks him to undertake a new piece of work he hands him, in the course of the discussion, one of these schedules. He does not ask the client to sign any agreement or sign or initial the schedule, and does not lay any particular stress on the schedule. He says simply enough to indicate that this is the basis on which his work is done.

This procedure is frankly a compromise between the alternative on the one hand of not mentioning the matter of charges and the other terms upon which the work is undertaken and trusting to secure payment of the reasonable value of the work done in due course, and the alternative, on the other hand, of asking the client to sign a formal agreement specifying the exact terms upon which the work is undertaken, and the rights and liabilities of the architect and the client in connection therewith. The best that can be said of it is that it is a vast improvement on the custom of most architects of saying nothing, and that in the case of a dispute it enables the architect to urge, with a fair chance of success, that the client was put "on notice" as to the terms upon which the work was to be carried out.

In a number of cases which have arisen, I have brought suit for this particular architect successfully on the theory that there was a definite contract between the client and himself to the effect that the work would be done and paid for under the conditions and at the rates specified in the schedule which he handed to the client. This is on the theory that the client, in going ahead with the work, after having been given a copy of the schedule and told that it represented the charges and terms of the architect, must be deemed legally to have agreed that the work should be done and paid for accordingly. This is treading upon very treacherous ground, however, and I am never very happy in these particular cases until the court or the jury has finally determined that a contract really did exist and that the terms of the contract are the terms which are stated in the memorandum. Testimony by the client or in his behalf that the memorandum was brought to his attention in a casual way only, or that it was not made clear to him that it was to control the particular job in which he was interested, or that verbal modifications of the terms stated in it were agreed upon, might well upset the whole contract theory and rob the schedule of much, if not all, of its effect.

In such event the architect would not be able to sue upon the theory of an express contract, but

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would have to depend for his recovery and for the enforcement of his rights upon the theory of what the lawyer calls a "quantum meruit." Translated into everyday English this means upon an implied agreement by the client to pay the reasonable value of the work done. When this is the case entirely new elements are introduced into the situation. The architect can not go into court and show that the client promised to pay him a definite sum and recover that sum accordingly. He must, on the contrary, bring in expert testimony—in addition to his own—to prove to the satisfaction of the court and jury the reasonable value of the services performed by the architect. The client can then introduce, on his part, testimony to show that the work was not of the value claimed, and that the experts who have testified for the architect have placed upon it too high a valuation. Thus, an entirely unnecessary issue is at once presented for the consideration of the jury, and the old condition of opposing experts testifying, some for the plaintiff and some for the defendant, is again presented. The result will probably be a compromise verdict at the best.

It needs no elaborate argument to show that a litigant who can present a definite contract signed by the man whom he sues is in a much stronger and more advantageous position than the claimant who comes into court without any such basis for his suit. Where a contract is made the defendant cannot avoid the issue by contending that the terms embodied in the agreement were not the terms upon which the work was done, because the court will not allow the terms of a written agreement to be varied or changed by an alleged verbal understanding inconsistent with them. Again, the client will not be allowed to attempt to show that the consideration to be paid the architect, as stated in the contract, is more than the work is worth, because, having agreed in writing to the specific amount, the court will hold that he is bound by the agreement which he has deliberately made. Proof of the written agreement and of the proper performance of the work contemplated by it will be enough. No expert testimony will be required as to the value of the work, and the jury, having the definite writing before it, will usually find a verdict for the full amount agreed upon.

The Danger of Any Representations or Guarantees with Respect to Cost

THE sum to be paid to the architect for his services is only one of the items which should be clearly understood and agreed upon. In many ways, it is of less importance than other points, such as the right of the architect to make necessary modifications, to authorize extras, the fact that the architect does not guarantee that the work can be done for any specified amount, the ownership of the plans and similar provisions.

If the amount due for services be the only issue, the architect may at the worst lose a portion of the gain which he anticipated would accrue to him from a particular job, and find that he has given his time for nothing or for less than he should receive for it. If, on the other hand, the client comes in with a claim against the architect based, for instance, on the allegation that the architect has represented and guaranteed that the work can be done for a definite amount, whereas in fact the cost of the work has been vastly more than the limit set by the architect, the latter is not only faced with the danger of losing his fee, but is quite likely to be called upon to pay the difference between the estimated cost and the actual cost. It is to prevent just such a claim as this, and to anticipate and make impossible misunderstandings and claims against the architect on many other points which I propose to note that the contract between the client and the architect is designed. The contract, if properly drawn, will take care of all of the danger spots in the ordinary relationship of client and architect.

For some years I have made notes of the danger points in the relations of client and architect from the point of view of the architect especially, and in getting out drafts of agreements governing the relationships of the two I have had in mind these very points. In asking me to write these articles, the editors of THE AMERICAN ARCHITECT believed that it would be of interest if I were among other things to point out the more important of these dangers and show how they can be guarded against and how a comparatively simple contract between architect and owner will remove the dangers and prevent unnecessary litigation and loss to the architect.

The matter of an alleged or impleaded guarantee by the architect, to which I have already referred, is very seldom considered by architects in their dealings with their clients, and yet among the earliest legal decisions are cases holding the architect liable on the theory of a guarantee of price on his part. This naturally comes about because one of the primary considerations with the ordinary client is that of expense and the cost of the work. This being so, at the first interview or interviews with the architect it is inevitable that such a client will ask the architect to tell him for how much the work can be done. This is the danger point. If the architect replies that he believes it can be done for a certain amount, but that he can manifestly only guess and give to the client his best judgment, and if he makes it clear that he does not in any way

guarantee that it can be done for the amount which he names the danger point is successfully passed and there will be no "come-back" against the architect. If, on the other hand, the architect, either in his natural desire to secure a lucrative or interesting piece of work, or thoughtlessly and with the best of intentions and desire to help the client and being convinced in his own mind of the accuracy of his judgment, states that the work can be done for a definite amount it is quite possible that he will so phrase his statement that the court will construe it to be a guarantee on his part that the work will be done for this amount, or, at the least, a representation by him made to induce the client to proceed with the work and binding upon him in the event that the client does so in reliance upon it. The written contract contains a clause providing specifically that any statements made by the architect regarding cost are not to be construed in any way as representations or as guarantees, but that, on the contrary, they are merely statements made by the architect and expressive of his belief; that they are made solely for the information of the client and that the architect is not to be held liable in any way on the theory of guarantee or otherwise in the event that the cost exceeds the amount estimated by him. This is a perfectly fair provision, and is so worded in the contract that no fair-minded client can well take exception to it. It effectually prevents, however, any danger of loss to the architect on this point, and at the same time is helpful to the client in that the architect being thus protected is willing to express himself with much more freedom than he would if he had in mind the necessity of making guarded estimates in the absence of such a contract provision. The client in consequence receives the benefit of estimates which the architect might ordinarily be unwilling to make.

Do Not Act as the Contractor

THERE is a somewhat similar but a less common danger in which the architect may become involved, namely, that he may, if his statements to the client regarding the cost of the building are phrased loosely, be held to have assumed himself the relationship and obligations of a contractor. This is not at all a fanciful danger, and is one which, if it come to pass, is calculated to place the architect in a distinctly unpleasant position.

It is but a few months ago that a well-known New York architect consulted me in a case where, innocently and without any intention on his part of assuming any obligations as contractor, he had become involved in this very particular. It all came about because the architect had written a few letters, the legal effect of which he did not consider, and which he quite naturally regarded as merely routine letters incident to the work proposed. A client had come to him with some tentative plans for the alteration of an existing building. After examining them, he had advised that certain changes be made which would improve the general lay-out and scope of the work. The client, as usual, wished to know how much the work would cost. The architect promptly sat down, and, in blissful ignorance of the legal effect of his phraseology, wrote a letter by which he meant to state merely the amount which he estimated would be involved, but which, as a matter of fact, was so worded as to give some ground for a claim by the client that the architect had offered, as contractor, to do the work for the sum which he mentioned in the letter.

The plan which had really been contemplated was that the client should place the monies necessary to cover expenses in the hands of the architect from time to time as the work progressed; that the architect should attend to the employment of the contractors to do the work and should make payment to them, *for the account of the client,* from the monies so received, and for his services should receive merely a stated architect's commission. This would have been all very well if the architect had covered himself by a proper letter or contract, but the situation was aggravated by the fact that in addition to writing the client as he did he did not make clear to the contractors the fact that he was employing them in behalf of the client, but carried on his correspondence with them and requested and accepted their bids, in many instances, in his own name. The client almost from the first made changes, some minor and some radical, in the proposed plans and work, and the cost of the work naturally began to run far beyond the figure originally contemplated. The client, as is sometimes the case, did not understand why making changes in the middle of the work—taking out a staircase here and putting it in there, changing a swell-front to a square-front and vice versa and the like—should affect the cost as it did. The inevitable result was that disagreements arose between the client and the architect, and the client, seeking legal advice, was advised to hold the architect responsible as the contractor for the work on the theory that the architect had assumed this obligation, and that the contractors whom the architect had employed were really sub-contractors of the general contractor, the architect.

The situation was further aggravated by the fact that many of these same so-called sub-contractors, not receiving the amounts due them because the client refused to advance further monies, manifested a determination to hold the architect responsible as the principal with whom they had dealt. The archi-

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tect, accordingly, was faced with the danger of losing his fee and of being held responsible as contractor for the performance of the work at a price far below the actual cost. All this was manifestly unfair to the architect, as he had undertaken the work in the best of faith and had suggested that he let the contracts to the contractors and attend to the payments for the purpose of saving money for the client. The client did not appreciate this, or if he did appreciate it was not inclined to "play the game," and, as a result, we had real difficulty in working out the situation in such a way as to safeguard the architect and extricate him from the position in which he had placed himself. If he had, in the first instance, drawn up some simple contract with the client the danger would never have arisen, as it would have been made clear at once by the contract that the architect was assuming merely the ordinary obligations of an architect, and was acting as the agent of the client in arranging for the carrying out of the work by the contractors. If the architect had at that time had at his office a form of contract such as that to which I have referred he would have had no difficulty in securing the signature of the client, the work would have been completed without loss to the architect, and in all probability the client would have remained satisfied.

(To be continued)

The Hartford Times Building

DONN BARBER, *Architect*

IT has become customary nowadays to use a thing once, then throw it away; but in the older order, when there was a more profound respect for material (and perhaps more difficulty in getting it than we are even at the moment encountering) it was quite general for the treasures of demolished buildings to become reintegrated in the new.

The Madison Square Presbyterian Church was not only epoch making in its architectural design, "a protest," as Stanford White, the architect, said, "against the prevalent idea that to be church-like a building must be in mediavel style," but it was also the first instance in this country where glazed tile was used throughout the architectural members in a carefully executed color-scheme. Through a cooperation between the manufacturers and the architect this tile was especially made to harmonize with the pale green columns of polished granite in the presentation of a jewel of architecture.

It happened at the time this church was being torn down that the Hartford Times was planning a building for a conspicuous situation—to fill, in fact, a vista between the Morgan Memorial (built of pink Tennessee Marble) and the new municipal building. It was necessary that the building make some contribution to such an environment.

At first a facade was studied along restrained colonial lines, built of face brick with stone trim; the cost seemed quite out of proportion for the result achieved. It was at this state of affairs that the material to be salvaged from the Madison Square church entered in. In a most entertaining way the story is told by Mr. Donn Barber, the architect, and published in the Hartford Daily Times, as follows:

"It was a curious and most unusual combination of circumstances that led to the use of the materials in the old Parkhurst church for the principal facade of the new Times building. In contemplating the problem presented for the facade of the new building and its important position and setting at the end of the wide short street between the Morgan Memorial and the municipal building, the matter of style, scale, color and materials became a serious and difficult consideration.

"It so happened that the proposed Times building, being a commercial building in every sense, and being a free standing building with light on all sides admitted of the principal facade being treated more or less independently of the other facades and somewhat in the nature of an architectural screen. The plan, arrangement and access to the building required merely a generous entrance into a public space on the first floor doing business with the public; access to stairways, corridors and to certain private offices. The lighting of these services was easy to arrange; therefore a wide latitude was possible in the selection of the size and character of openings. It was found that all the practical and working end of the building could be placed back of this front line of service and amply lighted through the other three surrounding walls.

"My attention having been called to the fact that the Parkhurst church, with its fine classic portico, was being demolished, I instinctively recalled to mind

the beautiful colonnades of Europe at the ends of streets and vistas; the Madeleine, Pantheon, and the Chambre des Deputes in Paris, and any number of examples in Italy and elsewhere. To refresh my memory in detail I turned to a photograph of the church and immediately seemed to see a possibility of using the six granite columns and two granite pilasters arranged as the porch motif of five bays on the church, into a colonnade motif of seven bays by bringing the wall pilasters around and out to a line in the plane of the columns; also, with many running feet of cornice and other members encircling the church, the chance of creating a long, flat composition.

"The wonderfully beautiful and picturesque precedents of the buildings of Italy, where the principal facades are treated frankly as such and backed up in many cases by buildings of an entirely different character in design, occurred to me. I went down to the church and satisfied myself that, instead of demolishing the building in the usual way, it was possible, with care, to take it down piece by piece, and number, pack and ship the pieces. I became enthusiastic and entered into negotiations with the contractor, which finally resulted in obtaining the major portion of the exterior materials of the entire church.

"In the design of the new Times facade, the original columns, pilasters and cornices are used: the steps, platforms and base courses all fitted together as they were originally, with the exception of the change in position of the pilasters. In the back wall of the arcade are used all the principal openings in the church facades. The large circular headed windows on the Twenty-fourth street facade have been used to form circular headed entrance doors, and the other windows on the Twenty-fourth street facade and the windows under the columns on the Madison avenue facade, and the two side doors, are also used in the new arrangement in this wall.

As the church was being taken down each piece of terra cotta was numbered according to an arranged scheme and although many of the pieces in the new building find themselves side by side as of old, transpositions have been made necessary in many places. For instance, there existed a certain number of definitely designed breaks and right angle turns in the cornice, so that I was limited in the new composition to these breaks that existed.

"It was also necessary to recombine the materials without any cutting, since that would have destroyed the spacing of the running ornament. It all happened very quickly after the church had been taken down, and the materials carefully packed and shipped, we were left with our numbered diagrams and numbered pieces to work with, inflexible in their sizes and their sequence, and certain photographs especially taken of what had been existing conditions. It amounted to a cut-up puzzle of a certain picture with the possibility of creating a new picture of the pieces of the old.

"In the new composition the original Corinthian order is changed to Ionic. By the use of an Ionic cap in the order and an added plinth between the column base and pedestal we were enabled to adjust the height of the order to our established required story heights. In comparing a photograph of the old church, now destroyed, with the studies of the new Times building, it is easy to see what materials have been used and in what combinations.

"It has been an inspiration and a most interesting experience to have been able to preserve and use these gorgeous materials, most of which could in all probability not be duplicated at the present time under the conditions obtaining in the material market, and also owing to the tremendously increased cost of building materials. The facade itself having been arranged for, the other problem was that of placing the facade of the Times building in a proper relation of height to the Morgan Memorial and Municipal building.

"There is a slight crown to Atheneus street from Main to Prospect street; the Prospect street end of Atheneum is somewhat lower than the Main street end. There is quite a sudden down hill grade on Prospect street from left to right, looking from Main. I have therefore taken the water table line of the Morgan Memorial and the corresponding water table line of the Municipal building, which are practically at the same level, and carried these lines across the Prospect street front of the Times building, creating a platform or approach on which the arcade motif of the building is placed.

"Curiously enough, it was possible to carry the balustrade motif round on a level of the balustrade motif of the other two buildings. Tile roofs have been added to increase the height of the building. These, with the trees on Prospect street and around the Times building, should add tremendously to the color and framing of the picture. It seemed to me little less than a crime that all the effort, skill, study and craftsmanship of the unique and wonderful materials that went to make up the Parkhurst church should be deliberately thrown to waste.

"I have every hope now that the drawings have all been worked out and details are settled, for success in the scheme and what we are able to accomplish may lead later to the saving of the materials of other distinguished buildings, which, in their turn, may have to be destroyed for the practical and commercial development of our cities."

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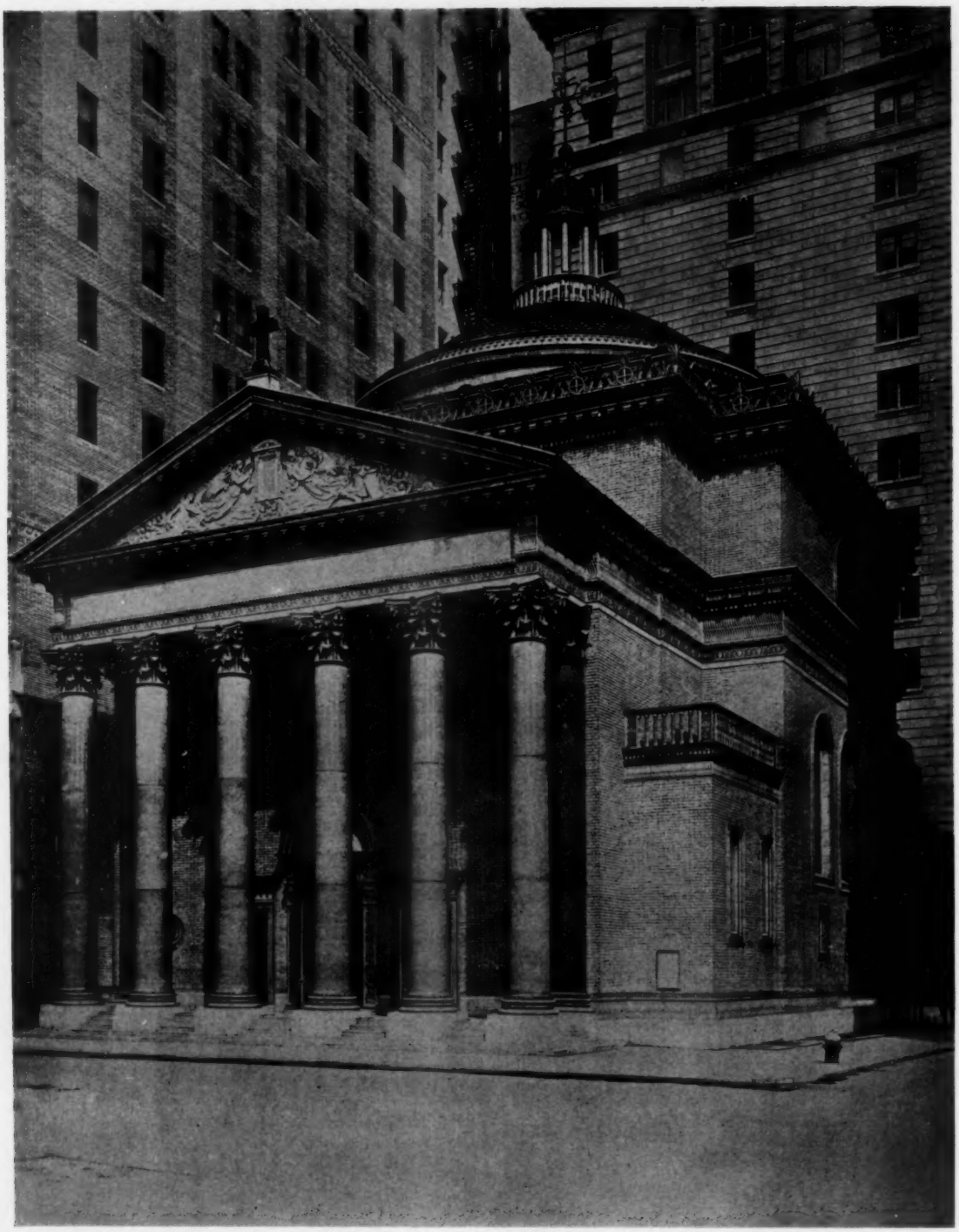
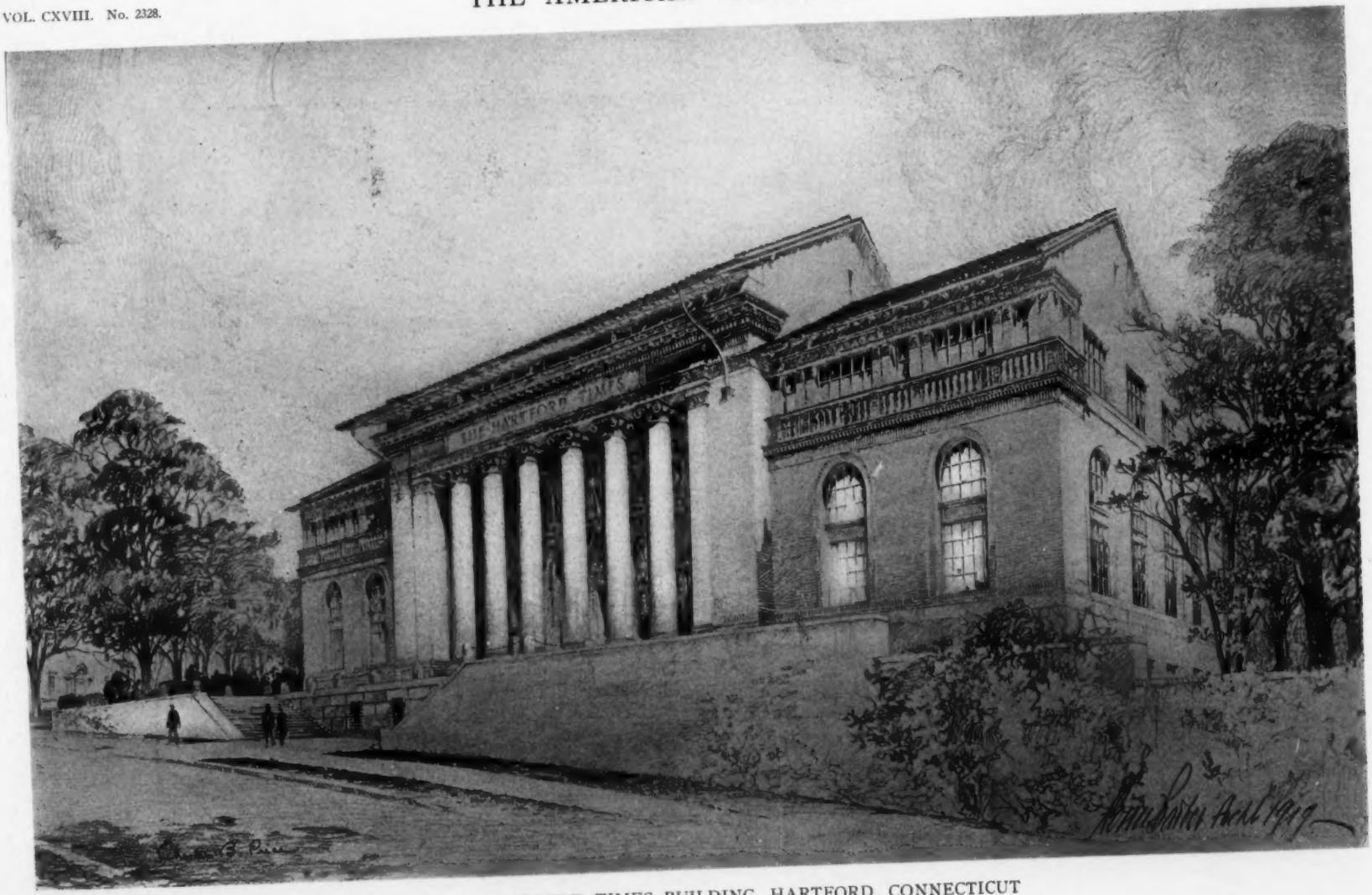


THE MADISON SQUARE PRESBYTERIAN CHURCH, NEW YORK

STANFORD WHITE, *ARCHITECT*



THE HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT
DONN BARBER, *ARCHITECT*

St. Paul's Chapel, New York

McBEAN, *Architect*

(See reproduction of the original drawing by O. R. Eggers in this issue)

WHEN, in 1764, this venerable chapel of Trinity Parish was begun, it was placed to face the river whose banks at that time were many hundred feet nearer to the church than they are today. Its eastern end was close to what is now known as Broadway and owing to the pedimented portico that adorns it, is often mistakenly believed to be the front of the church.

One McBean was the architect and it is gleaned from the records of the church that, owing to slow means of transportation of material and a scarcity of competent labor, this chapel was three years under construction. It has been claimed that McBean was at one time a pupil of Gibbs of London and this claim is bolstered by the fact that this church strongly resembles St. Martin's-in-the-Field in London, which was designed by Gibbs. The fact remains that "old St. Paul's," as it is affectionately called by New Yorkers, is one of the most satisfactory examples of our extant Colonial ecclesiastical architecture. It stands in the center of its churchyard on the block bounded by Vesey, Fulton, Broadway and Church streets and is today, as for more than a century past, a spot hallowed by every association, religious and civic, that is part of the heritage of every New Yorker. Its interior preserves all of the aspects of its English origin even to the three ostrich plumes (the crest of the Prince of Wales) that surmount the canopy over the altar. Here Washington came after his inauguration as President of the United States to attend the solemn service that formed a part of his inauguration ceremony. The pew in which he sat has been kept exactly as it was at that time.

One may judge the influence of the quiet dignity of this church if on any noonday he will visit it. Either within the dimly lighted interior, or the steps of its front or western entrance, or along the pleasant paths of the graveyard, there will be seen many office workers in the neighborhood. Here they daily seek for an all too brief spell the quietness and rest that such a sanctuary will afford.

On the wall of the eastern or Broadway end of the church there is a wall monument placed there as a record to the memory of General Richard Montgomery who lies buried in the churchyard.

BASILICA OF S. EUSTORGIO, MILAN, ITALY

ST. PAUL'S CHAPEL, NEW YORK,
THE AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

Notable Examples of Early American Architecture

THE more nearly we approach to certain ideals in the development of architecture in this country, the more reverently and respectfully do we regard the few remaining examples of the architecture that was created in these United States between the close of the Revolution and the opening of the Civil War. In fact, it may be said that there is a pronounced tendency on the part of many of our most successful architects to hark back to the architecture of the latter years of the eighteenth and the first half of the nineteenth century.

This sentiment is now more prevalent than ever before. Men, who from the theatre of the war in Europe have viewed the awful calamity of devastated areas have seen the architectural masterpieces of the world laid in ruin, have now returned to this country imbued with an increased respect for the tangible evidence of the good in their profession and a strongly marked veneration for that which is left to us in the United States.

It is futile to hope that these may all be saved. The dollar must have its way. Its present impetus would seem to menace many structures whose quiet dignity, good architecture and venerable tradition should be—but are not, it would seem—a valid reason for their preservation. The devastating march of what is called "progress" will slowly but inevitably destroy landmarks that are to architects the very essence of their art, the things that should live forever.

To make a permanent and the best artistic record of at least parts of some of the more meritorious of these early American buildings, THE AMERICAN ARCHITECT has arranged for the presentation of a series of reproductions of drawings the first of which appears in this issue. The selection of subjects has been carefully made and, as delineated by Mr. O. R. Eggers, is of the highest architectural value. When completed these drawings will provide a collection of unusual historical and architectural value and a fund of suggestion of the largest importance.

Office Accounting

THERE is presented in this issue the first of a series on Organization and Accounting Systems for Architects' Offices.

No other artist finds it necessary to maintain an accurate system of accounts. No man engaged in any of the arts handles, as agent for another, such vast sums of money as do architects.

Obviously it is necessary that an accurate record be kept of all these transactions. In fact, success in practice hinges on a satisfactory accounting.

To support the contention that architecture is a business as well as an art, this one thing of accurate system of accounts is alone sufficiently convincing

Mr. Van Arsdall's long association with one of the largest architectural organizations in the Middle West, qualifies him to authoritatively present his topic. The method outlined is not a theoretical discussion, but the description and various forms presented constitute part of a system that has been in actual use for a long time.

Articles of this sort have a very large practical value. Just at this time while most important building operations are suffering from the influence of the government probably meant to be paternal, but smacking largely of a "step-father" attitude, architects will have time to put their offices in order. Mr. Van Arsdall outlines a safe method of procedure.

The Railway Labor Board Award

HOW are we to find money to pay the award of the Railway Labor Board? Does it mean that further inroads are to be made upon the architect's already meagre portion?

Now comes an award of $600,000,000 increase in wages to the railway employes of the country—an immense sum of money which must blossom forth from nowhere or be pared off of somebody's portion. Doubtless the $600,000,000 is going to be added to freight rates and with it a few hundred million more which is necessary for the rehabilitation and development of the railways. And this increase in the cost of delivery of goods is to be

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added to the bill the consumer gets, with some slight and commensurate added profit for the tradesman who collects the bill.

Payment in advance for our transportation development seems the only thing to do. There are two alternatives—pay or go without. We may even do both for a while.

The inveterate optimist cannot expect any stimulus to building programs from this one more added burden. And the particularly unfortunate position of the architectural profession is this: That an income already too picayune to be taxed must be further reduced by the retardance of building construction that has long been contemplated and by the abandonment of schemes even less well defined.

It does seem, however, that we are now getting so deep in the mud that we must soon strike rock. More fundamental than the matters of profits and high wages is an actual need for buildings and with it the basic fact that buildings to be built for efficiency must be planned by one who knows his business.

The tone of the newspapers in regard to these matters of wage awards and taxes, is that "the American public which foots all the bills, isn't going to be bled white forever." Most of this bleeding seems to be but a transfusion—a trick to which the professions have not yet caught on. But if they are of this "public which foots all the bills," well, there is just so much blood in a turnip and no more.

Color in the City Streets

IN letters to the editors published in the London architectural press there arises a plaint against innovations that originate mainly in this country. The bulk of this tale of woe seems to consist of objections to tall buildings as destructive of traditions long cherished and which many ultra-conservative men are loath to relinquish. Just now there are published letters both for and against color in street architecture. One man rails at the tendency to introduce multi-colored terra cotta in areas that for centuries have been gloomy through dinginess. Another will loudly acclaim the merits of color that is shown in the smoke and fog stained surface of stone or granite. Still a third holds the stucco facade that has been stained in lighter shades as anathema. "Who shall decide when doctors disagree?"

It would not seem necessary to advance many arguments as to the desirability of color in our city streets, and particularly in a city whose atmospheric conditions are like our own Pittsburgh. The very monotony of brick and stone and mortar in their natural colors breeds morbidity and makes one yearn for the country roadside and the open places. There are no good reasons why all this question of color should not more seriously receive the attention of architects both here and in England. "How use doth breed a habit in a man." How we do go on year after year following in the rut and dead level of monotony.

Here and there in all the cities of this country are to be found men of sufficient originality to attempt an introduction of color in the facade of buildings. The results, while often not satisfactory from an accurate color standpoint, are none the less encouraging indications of a desire to get away from the commonplace. The trouble with the introduction of color is exactly similar to the selection of motives of design in any particular locality. Each architect and his client works independently of his neighbor and the result while taken independently is commendable, is not when grouped as satisfactory.

DOWN in Greenwich Village, in this city, where the conversion of substantial dwellings into two and three room apartments is being carried forward on a large scale, it has been desired to preserve the artistic aspect of this old neighborhood. As a means to such an end, the brick fronts are being covered with colored stucco and the window and door frames given a contrasting color. It is interesting to note how this innovation is alluring tenants and how eagerly these converted structures are sought out and rented at good prices and for long terms. Whole blocks have been transformed from a dreary monotony of red brick, duplicated structures, to broken lines of color that present a pleasing contrast.

In more pretentious buildings of the loft and office types, there has been a tendency towards the introduction of color, but mainly in low tones that do not impress their excellence of effect and which with weathering become uninteresting.

The selection of color of sufficient brilliancy should be easy, and with its more general introduction it is safe to predict the popular verdict will be a strong support of every architect who will essay a venture in the direction of applied color to the exteriors of his buildings.

Criticism and Comment

The Other Side of Billboards

The Editors, THE AMERICAN ARCHITECT:

In connection with the "Other Side" of Billboards appearing in your June 30th number I would suggest to Mr. Oakley, whose presentation of the Other Side you quote, that he discovers all the spots in nature where she is absolutely hideous and by him supposed capable of artistic improvement by spellbinding masterpieces, "the fairy dream-like inspirations of artist's messages" and there erect them that all who run may read how God's works are infinitely inferior.

A further suggestion would be to cover the "frightful piles of stone and iron slung together by contractors" and the "thousands upon thousands of repellant rows of houses" with the powerful appeals of Mr. Oakley's enthusiastic imagination that all their ugliness he alleges may be obliterated in chromatic posters in their "commanding dignity," "force and grandeur."

We have seen the city made hideous with posters —and designed by "master-painters"—and the runner did not stop to read, but fled. It is sad to realize that the impressionist sometimes seems to really believe in his impressions from some erratic or contradicting bent of mentality; hence our asylums for their care.

The influence of the billboard for "better art" and "better life" is to heartily curse the cause that gave it birth as Mr. Pennell does so eloquently.

It is possible Mr. Oakley is a humorist, in which case I apologize for taking him seriously.

New York. H. EDWARDS-FICKEN

Saving the Surface with Paint and Varnish

The decay of structural materials is rapid. The microscope will record the initial start of such decay even after twenty-four hours' exposure of some building products, states Henry A. Gardner in *The Decorator,* and the naked eye is sufficiently strong to perceive the erosion often evidenced in a few weeks. Those materials that show relatively slow decay almost invariably present at first, or later assume, a gloomy color that is objectionable from several standpoints. It is, therefore, apparent that surface protection through paint or varnish application is quite as important as sound engineering or design.

A microscopic view of even the dressed timber that is used for interior trim in building, for musical instruments and cabinet work, for automobile or yacht construction, will show the deep channel-like grain of the wood fibre. When varnish is applied the pores are filled up and a smooth water repelling, wear-resisting surface results. The beauty of the grain and coloring of the wood is at the same time greatly enhanced.

The printed designs on some types of floor coverings wear off as the result of foot abrasion. The unsightly dark colored base may then be exposed. Occasional coats of varnish prevent this defect. Even high-grade, inlaid linoleum is improved and given greater longevity when varnished. The surfaces of all types of floors or floor coverings may be beautified and made dirt and water resisting with floor varnishes.

BRICK AND METAL SURFACES:

Building brick may absorb from 10 to 15 per cent. of water. If a brick building should be subjected to constant rain for several days it is conceivable that many tons of water would be absorbed. Dampness might then prevail within the building, and in cold weather the tonnage of coal required to heat the interior would probably be greatly increased. The application of paint to brick fills up the pores and produces a water-resisting film. The use of white or light tinted paints improves the appearance of the structure and gives sufficient light reflection to the airways to repay for the expense of painting.

The almost universal custom of painting the interior brick walls of factories is now being extended to cover the exterior walls as well. Many gloomy appearing brick residences are also being transformed by exterior painting.

Metal surfaces may appear smooth to the naked eye, but under the microscope they often evidence a rough, porous condition. On many metals this condition is responsible for moisture retention and subsequent corrosion. Such metals as iron and steel demand immediate protection to prevent rust accumulation. The loss suffered yearly through ne-

glect to keep metal well painted amounts to many millions of dollars.

CEMENT AND WOOD:

Cement or stucco invariably present a rough surface. Water absorption is rapid. Dust and soot accumulation is marked, especially in industrial communities. All these defects may be prevented by paint application. It is safe to state that the value of any cement building may be increased from 10 to 20 per cent. by the use of a pore-filling, water-resisting paint. Dust adherence then becomes minimised. Cement structures are almost invariably painted when appearance is a consideration.

A wood panel one-half of an inch thick, when exposed to moisture, may gain ten ounces per square yard in a week. When exposed to water it may gain 50 ounces. Moisture absorption, checking, fungus growth and fibre abrasion may take place on uncoated wood. When coated with paint, the moisture absorption is reduced to a negligible quantity and the surface is preserved from attack. Wood lasts indefinitely if kept well painted.

Wall paper is fibrous and absorbent. It may retain moisture and dust. Paints are, therefore, generally preferred for wall decoration. On existing papered walls, paints may be applied direct to the paper if desired. A smooth, washable surface of any color may thus be produced.

LIGHTING WITH PAINT:

People are just beginning to appreciate the value of paint from a lighting standpoint. For instance, the now almost universal practice of painting the interior walls and ceilings of factories in order to increase the illumination has developed within a few years. The tremendous savings in electricity or other illuminants, and the increased efficiency of the workers resulting from such practice, have given mill owners an appreciation of paint for this purpose. Discussing these matters in *The Decorator*, Mr. Henry A. Gardner believes a further and even greatly extended use of paint as an illuminant reflector will soon be observed.

In practically every old-style urban railroad terminal, he says, there are immense train sheds which present a neglected and gloomy appearance. Where paint was used a very dark color was generally selected, as paint was looked upon simply as a preservative, and black was the prevailing color of metal preservative paints. In some instances, however, no paint was applied. If such structures should now be painted so as to provide a finishing coat of white or of light tint, the amount of light inside the sheds would be tremendously increased. Accidents would be prevented and many glaring lights might be done away with. Moreover, the arriving guest would not feel depressed or secure a wrong impression of the community.

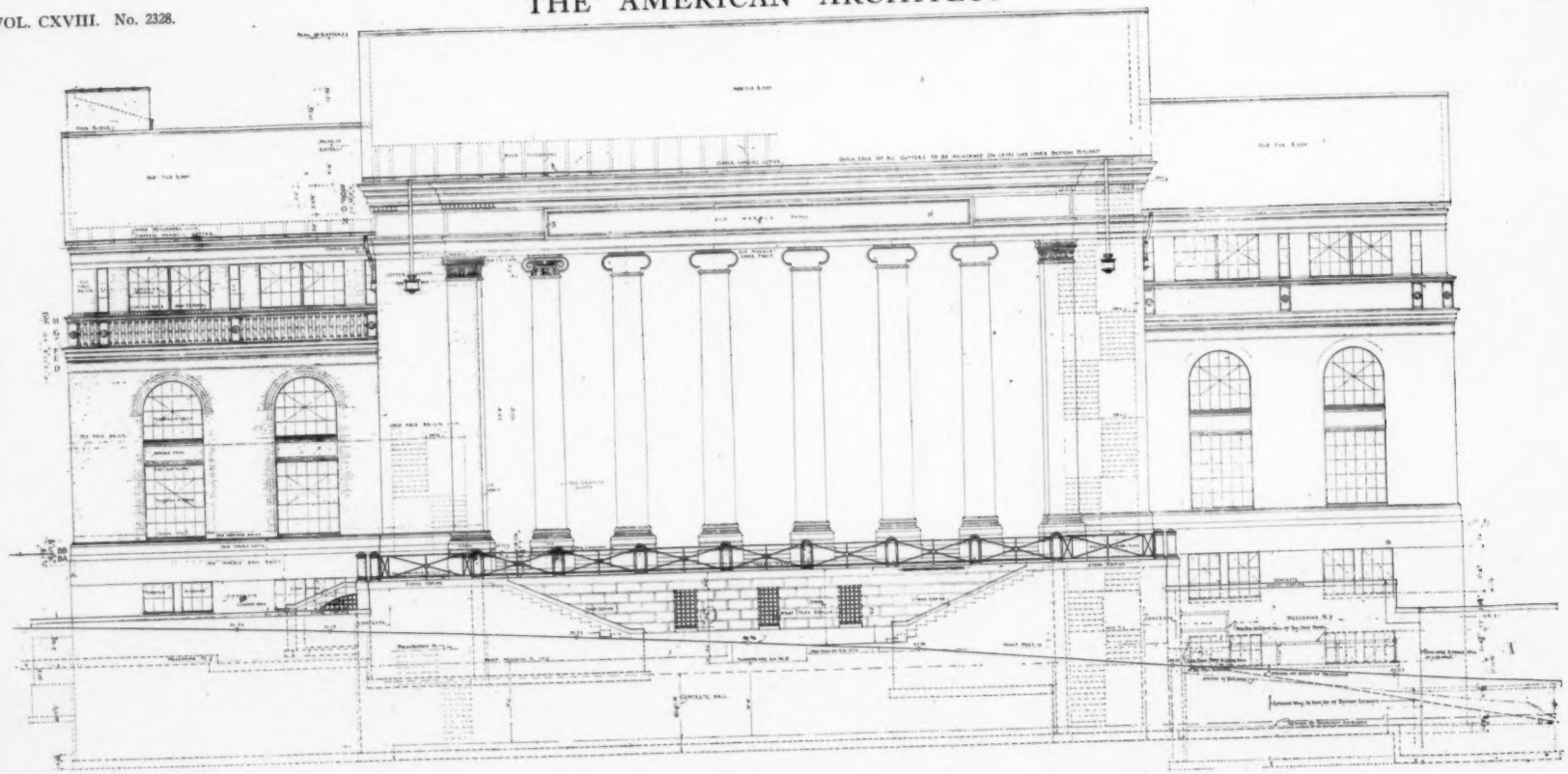
While it is appreciated that the smoke from the locomotives would stain white paint, its surface would not become as dark as the uncoated structure. In any event, the lower parts might be washed occasionally. Similarly, in warehouses, freight sheds, wharf houses, interiors of freight cars, vessel holds, etc., the application of light paints to the present uncoated interiors would immensely improve the working conditions.

Very little has so far been done with paint or lighting machinery. For instance, many of the surfaces of the machines in large factories are uncoated. They gradually assume a dark color that gives shadows that may be responsible for many accidents. If the working surfaces of such machines should be painted white, a much greater amount of white light would be obtained. Accidents would thus be minimized and production efficiency increased.

While the use of paint for marking asphalt street for traffic regulation purposes has increased in some cities to quite an extent and has effectually aided in bringing about a more general observance of the rules of traffic, it can readily be seen how much greater should be the extension of this principle. For instance, all stone curbing on dark or poorly lighted streets might be painted white. A decrease in motor accidents would probably result. Along the open highways and boulevards, especially at dangerous corners and along embankments, marking stones and the trunks of trees at well-defined distances on either side, if painted white, would reflect the illumination afforded by headlights and make night driving much safer.

ONE WAY TO CONSERVE FORESTS:

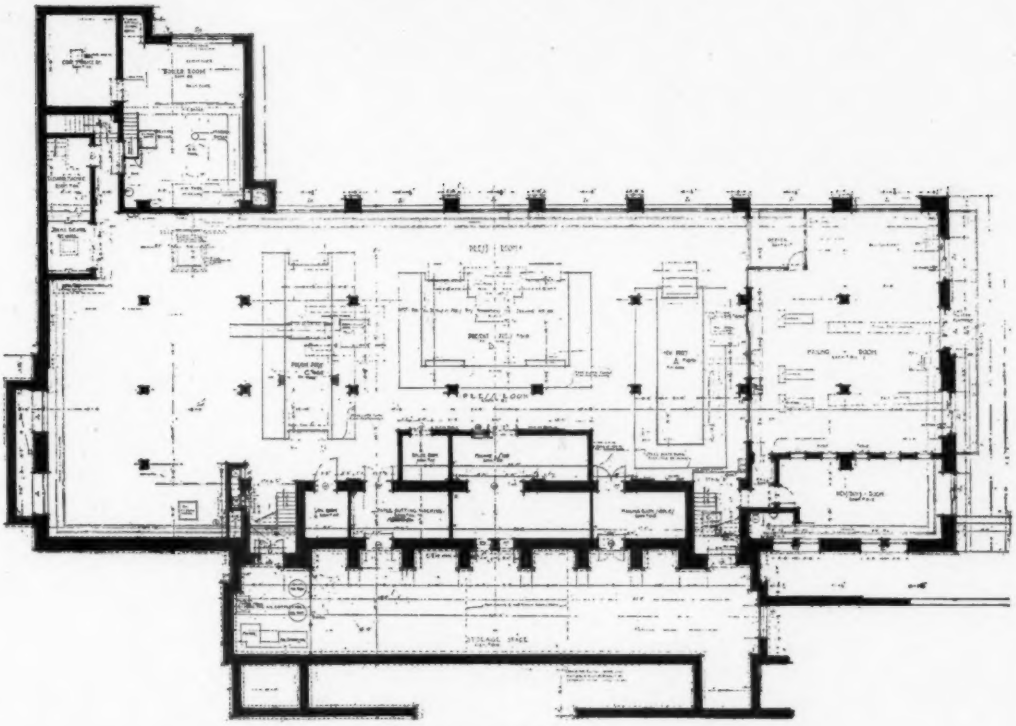
It would be difficult to state how many million telegraph poles line the highways and railroads of America. It is not difficult, however, to show that these poles, under the climatic conditions existing in many sections, do not last indefinitely. Impregnation of the underground part is a practice that is generally adhered to in order to provide protection from underground decay. The upper part, exposed to the air, is seldom surfaced, and the ravages caused by exposure to the air soon become apparent. It is quite fair to state that overground protection, to be had through paint application, is also necessary, especially on all that are squared or otherwise dressed. Such treatment would extend the replacement period and help to conserve forests.



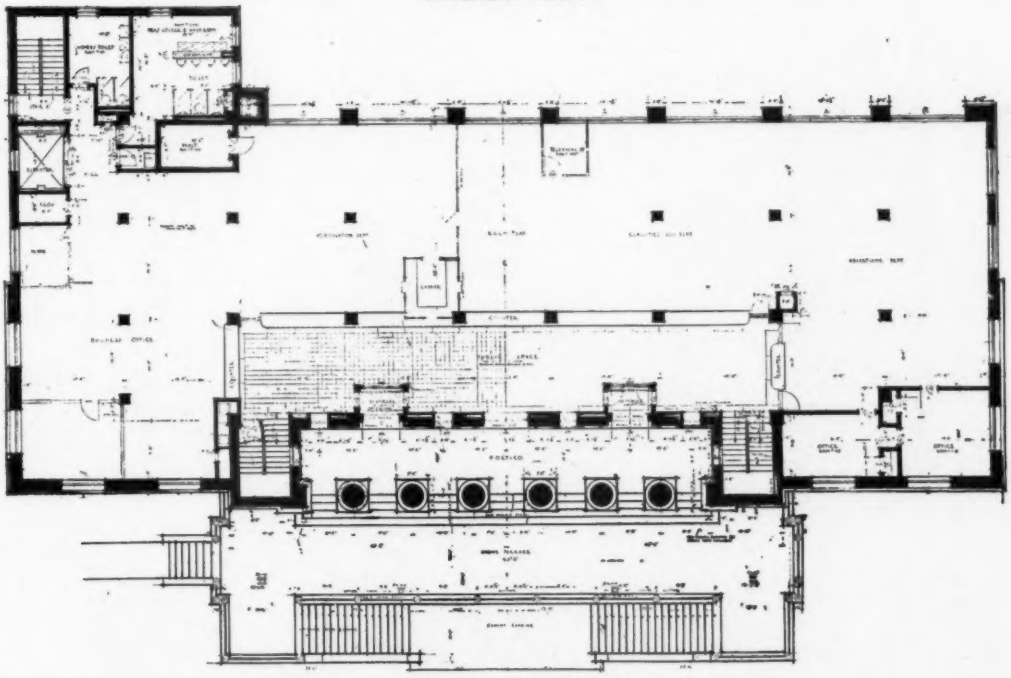
FRONT ELEVATION

THE HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT

DONN BARBER, *ARCHITECT*



BASEMENT PLAN.



MAIN FLOOR PLAN

HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT

DONN BARBER, *ARCHITECT*

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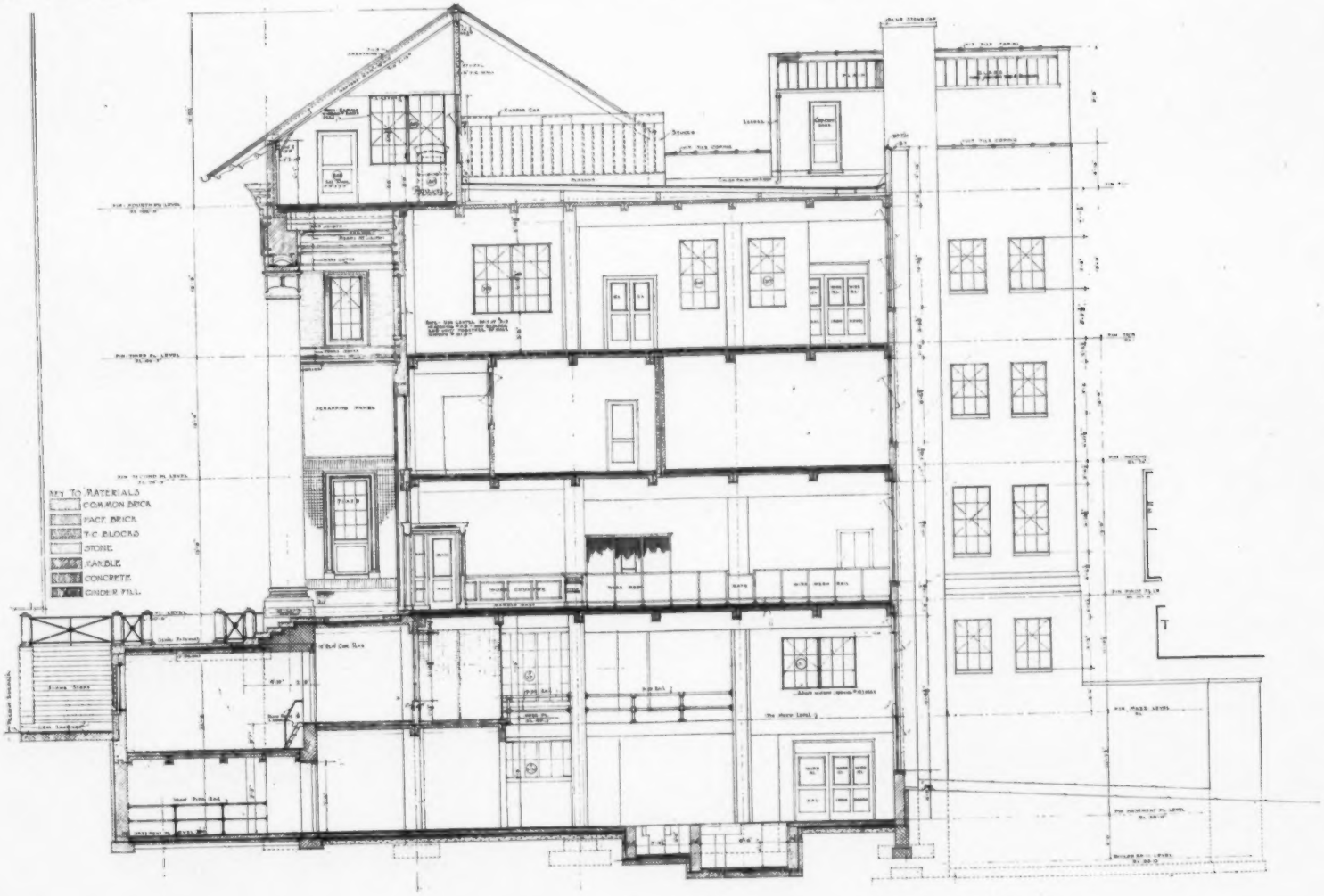
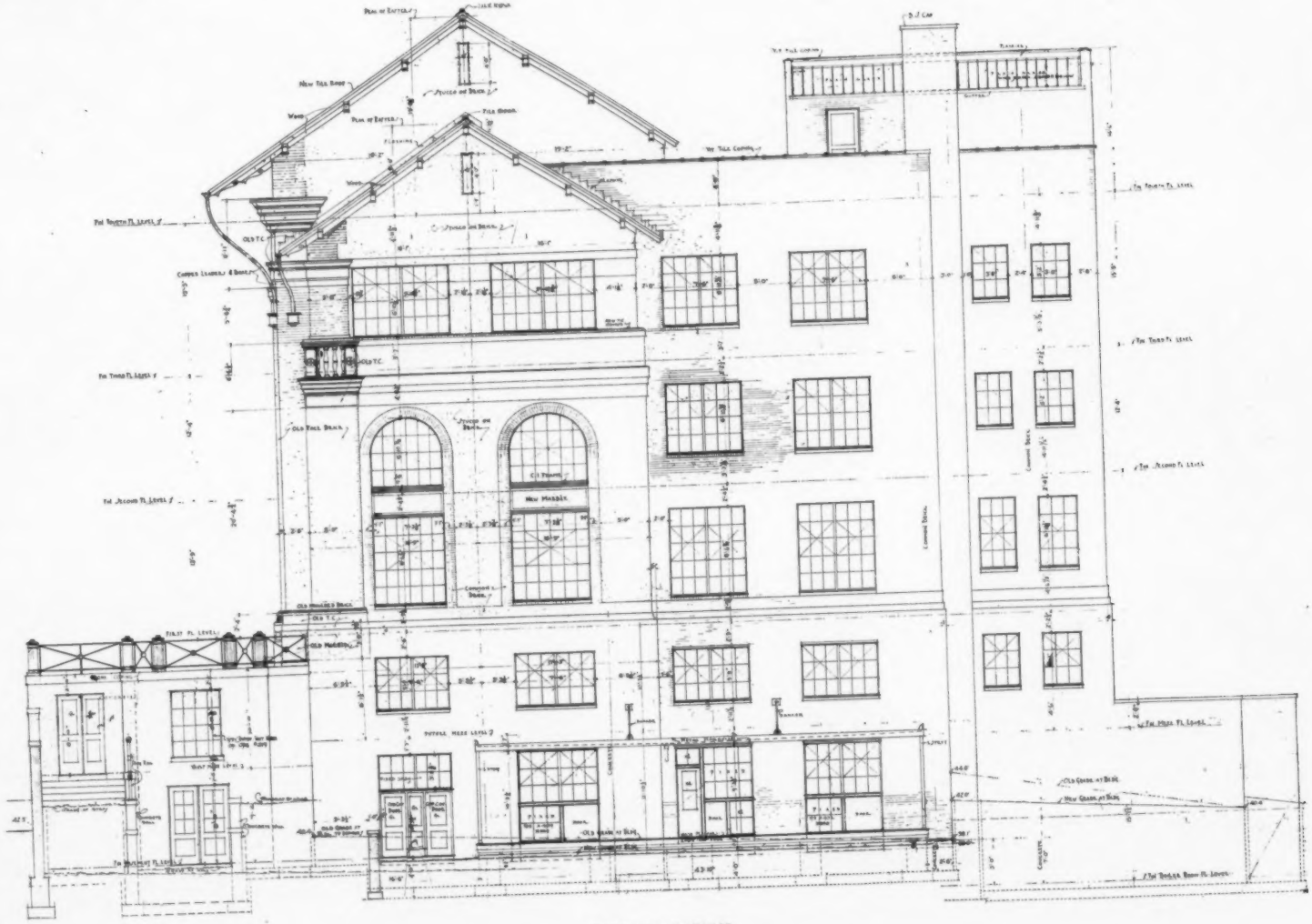


SECTION

HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT

DONN BARBER, *ARCHITECT*



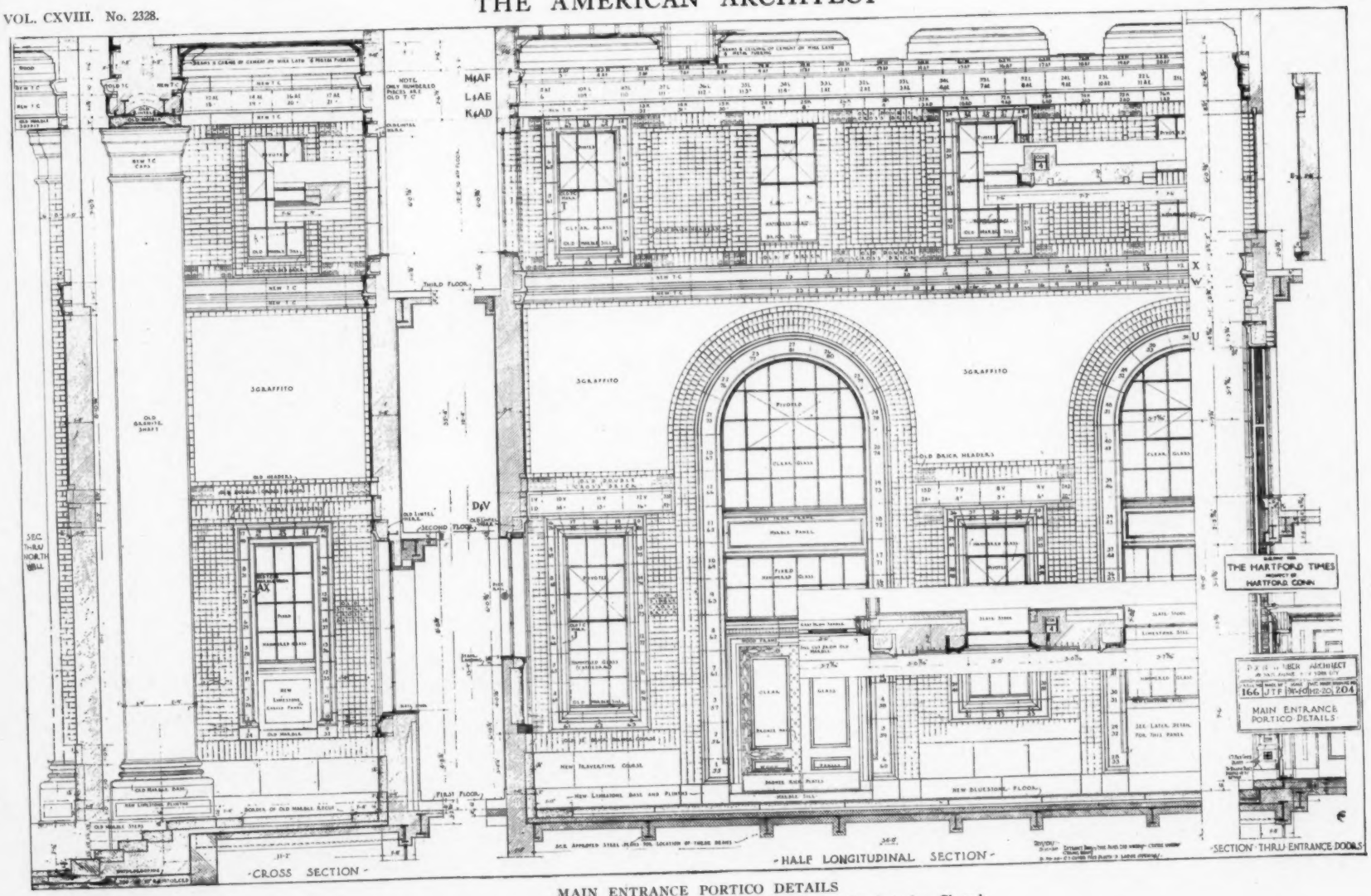
SIDE ELEVATION

HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT

DONN BARBER, *ARCHITECT*

WDX

LIBRARY
THE DETROIT EDISON CO.
AUG 9 1920

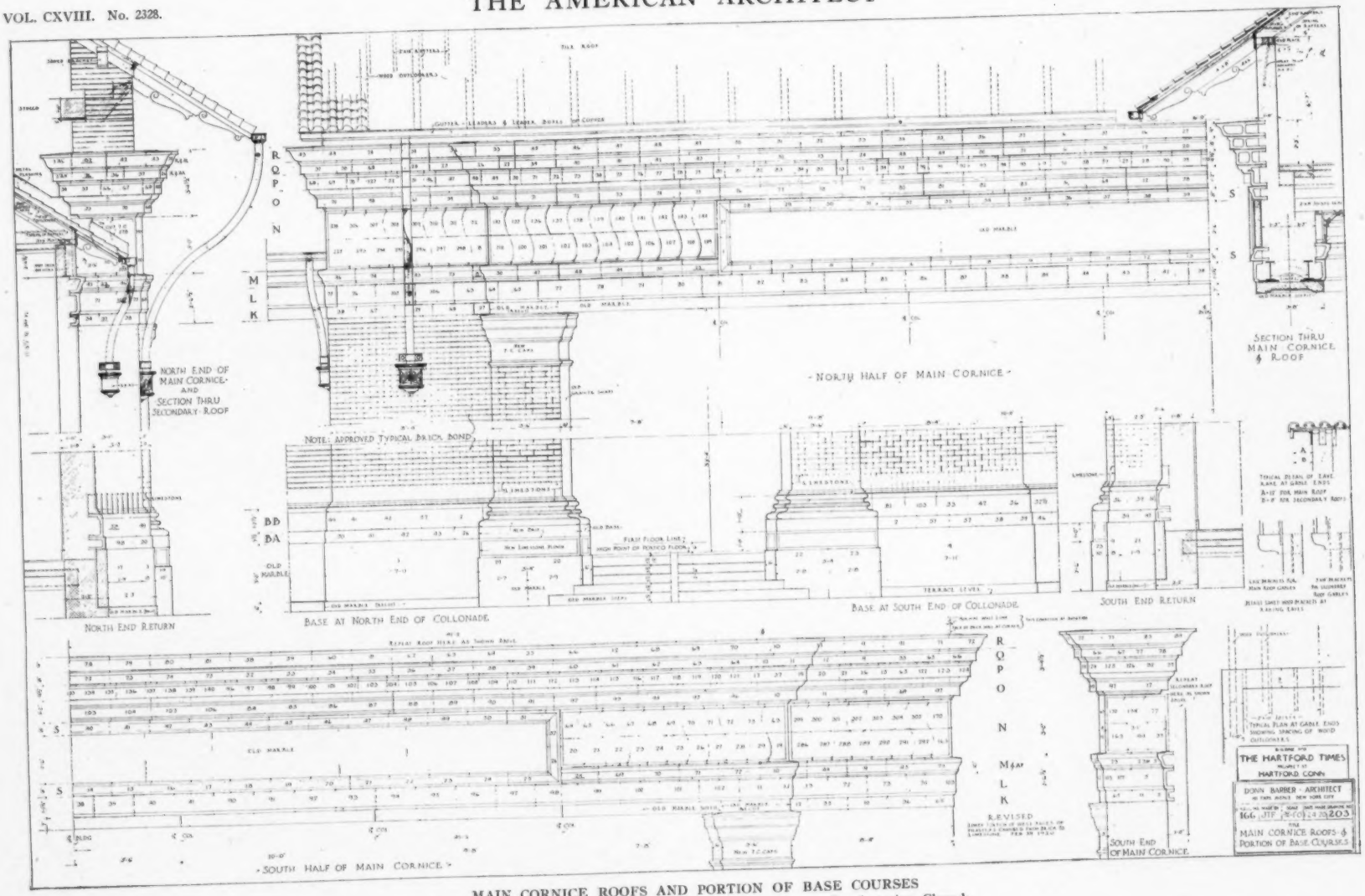


MAIN ENTRANCE PORTICO DETAILS

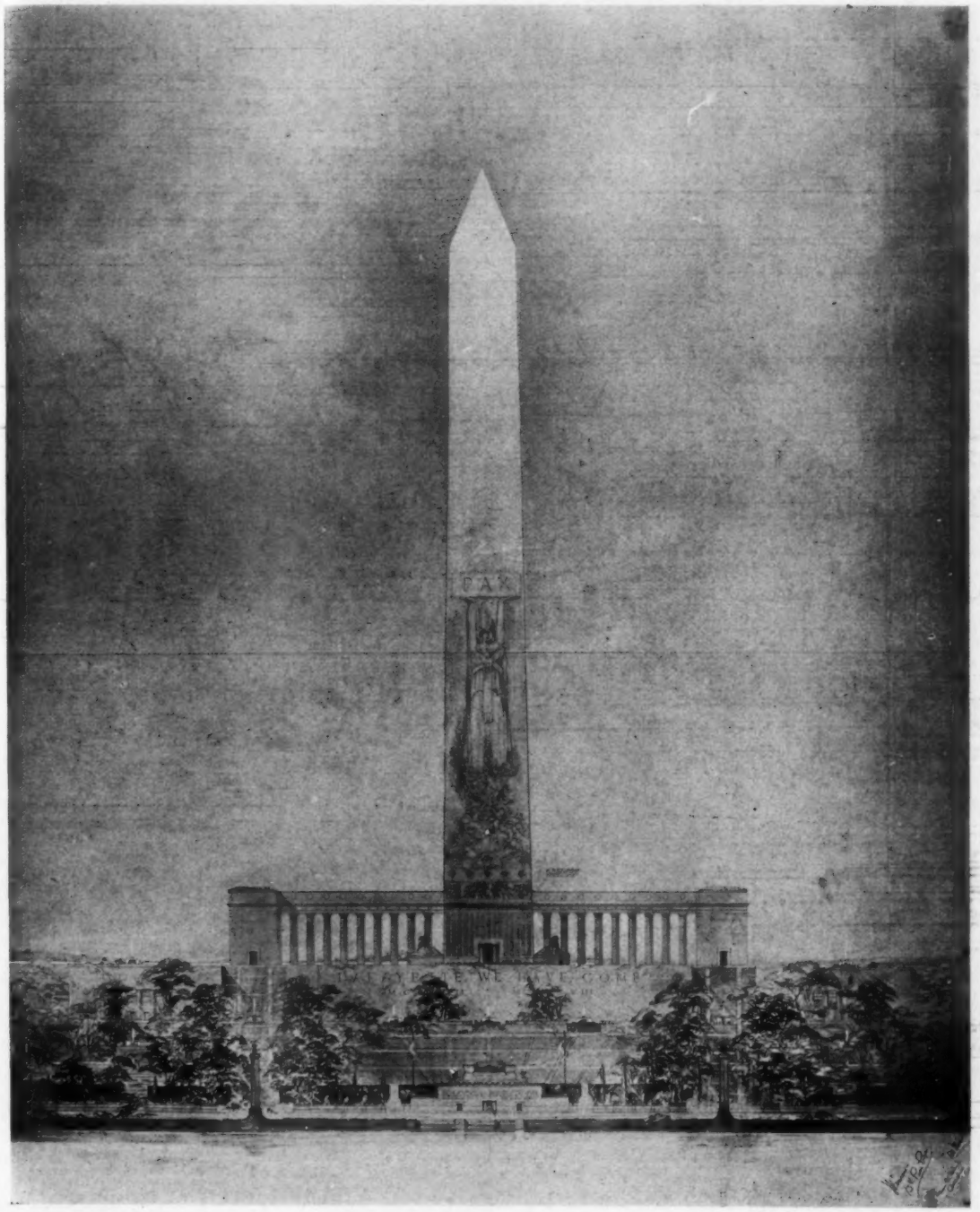
Showing the adaptation of materials from the Madison Square Presbyterian Church

HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT

DONN BARBER, *ARCHITECT*


NORTH END OF MAIN CORNICE AND SECTION THRU SECONDARY ROOF
NORTH HALF OF MAIN CORNICE
SECTION THRU MAIN CORNICE & ROOF
NOTE: APPROVED TYPICAL BRICK BOND
NORTH END RETURN
BASE AT NORTH END OF COLLONADE
BASE AT SOUTH END OF COLLONADE
SOUTH END RETURN
SOUTH HALF OF MAIN CORNICE
SOUTH END OF MAIN CORNICE
REVISED
THE HARTFORD TIMES
HARTFORD CONN
DONN BARBER - ARCHITECT
MAIN CORNICE ROOFS & PORTION OF BASE COURSES

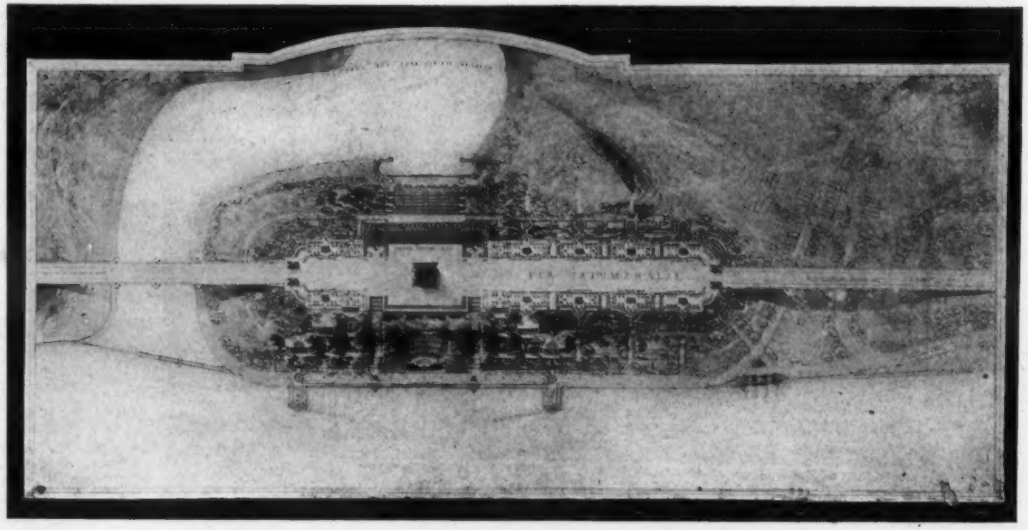
MAIN CORNICE ROOFS AND PORTION OF BASE COURSES
Showing adaptation of materials from the Madison Square Presbyterian Church
HARTFORD TIMES BUILDING, HARTFORD, CONNECTICUT
DONN BARBER, *ARCHITECT*



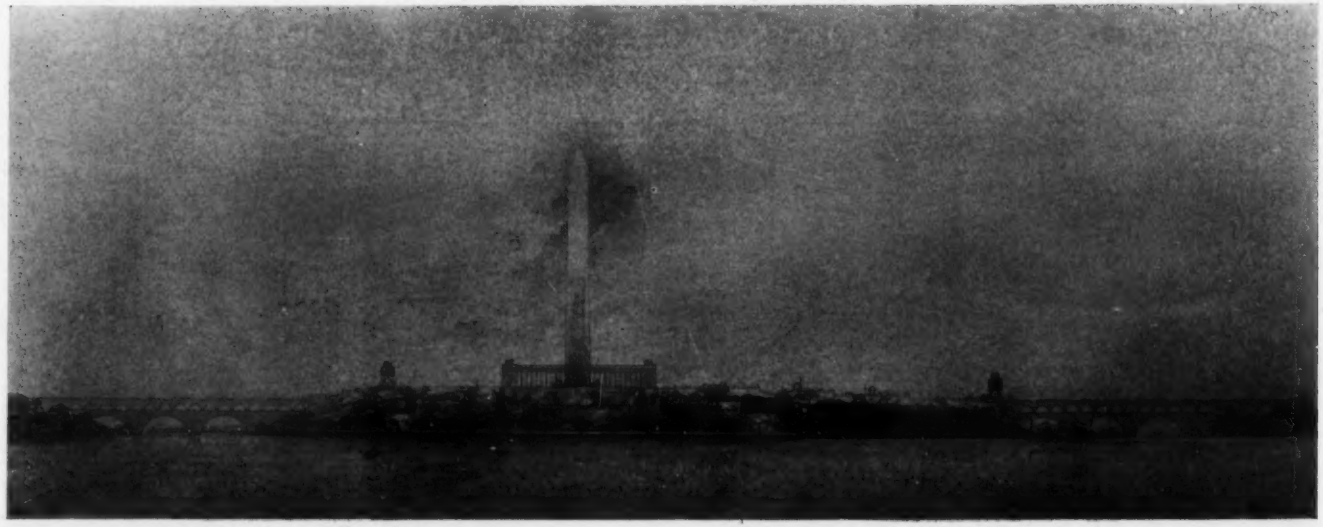
D. McLACHLAN, JR. ATELIER HIRONS

PRIZE WINNING DESIGN (1st Medal).

FINAL COMPETITION FOR THIRTEENTH PARIS PRIZE, SOCIETY OF BEAUX ARTS ARCHITECTS.

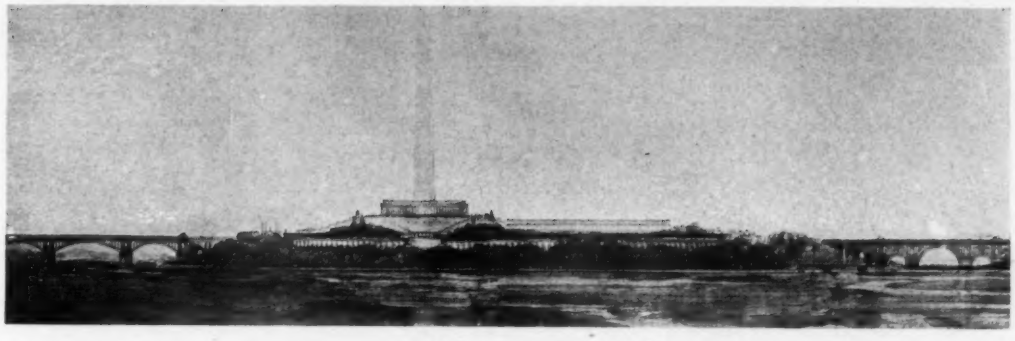


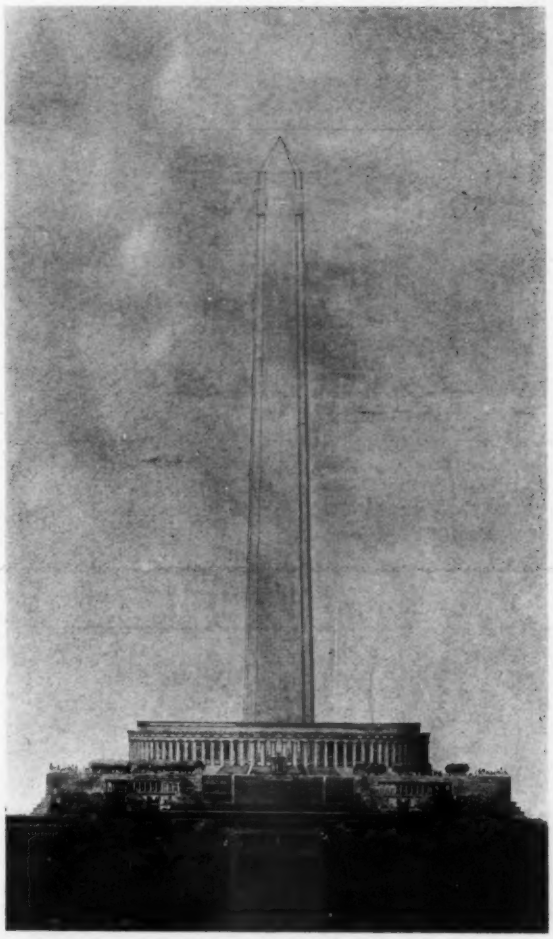
FINAL COMPETITION FOR THIRTEENTH PARIS PRIZE, SOCIETY OF BEAUX ARTS ARCHITECTS

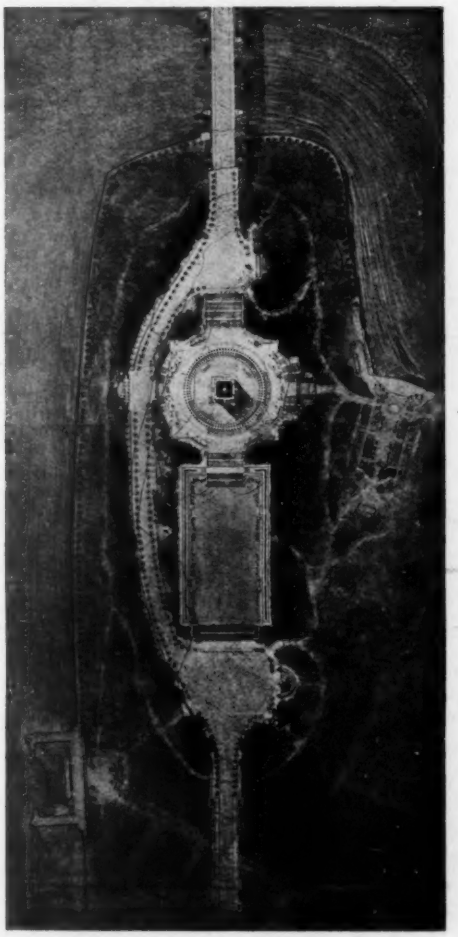


D. McLACHLAN, JR. ATELIER HIRONS.

PRIZE WINNING DESIGN (1st Medal).







R. S. SIMPSON

CARNEGIE INSTITUTE OF TECHNOLOGY AND PITTSBURGH ARCHITECTURAL CLUB.

PLACED SECOND (1st Medal).

FINAL COMPETITION FOR THIRTEENTH PARIS PRIZE, SOCIETY OF BEAUX ARTS ARCHITECTS.

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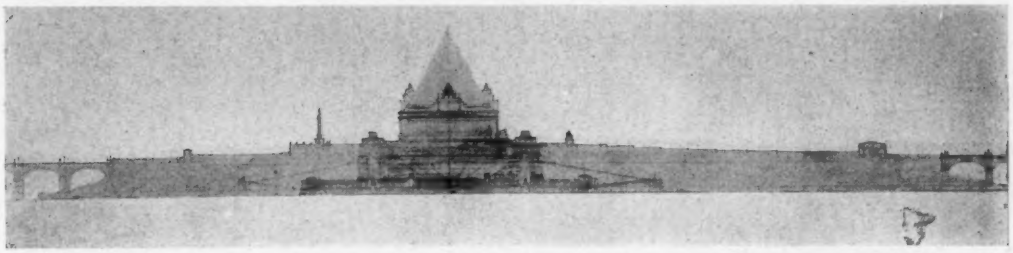
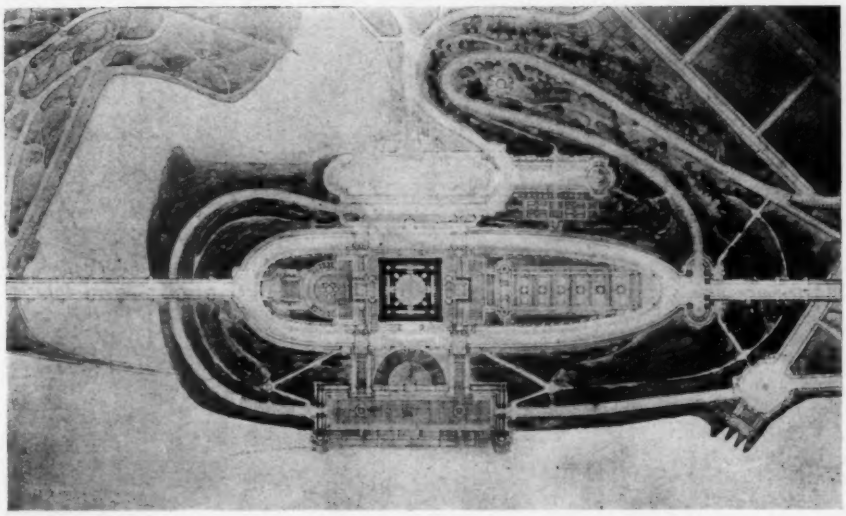
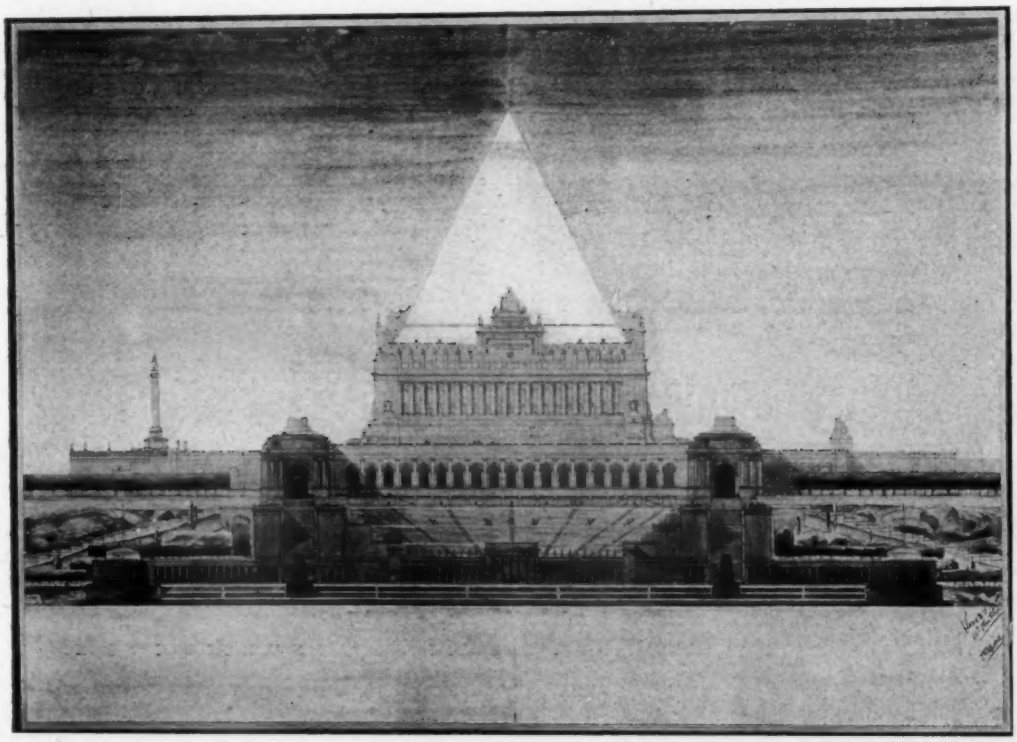






F. A. CHAPMAN

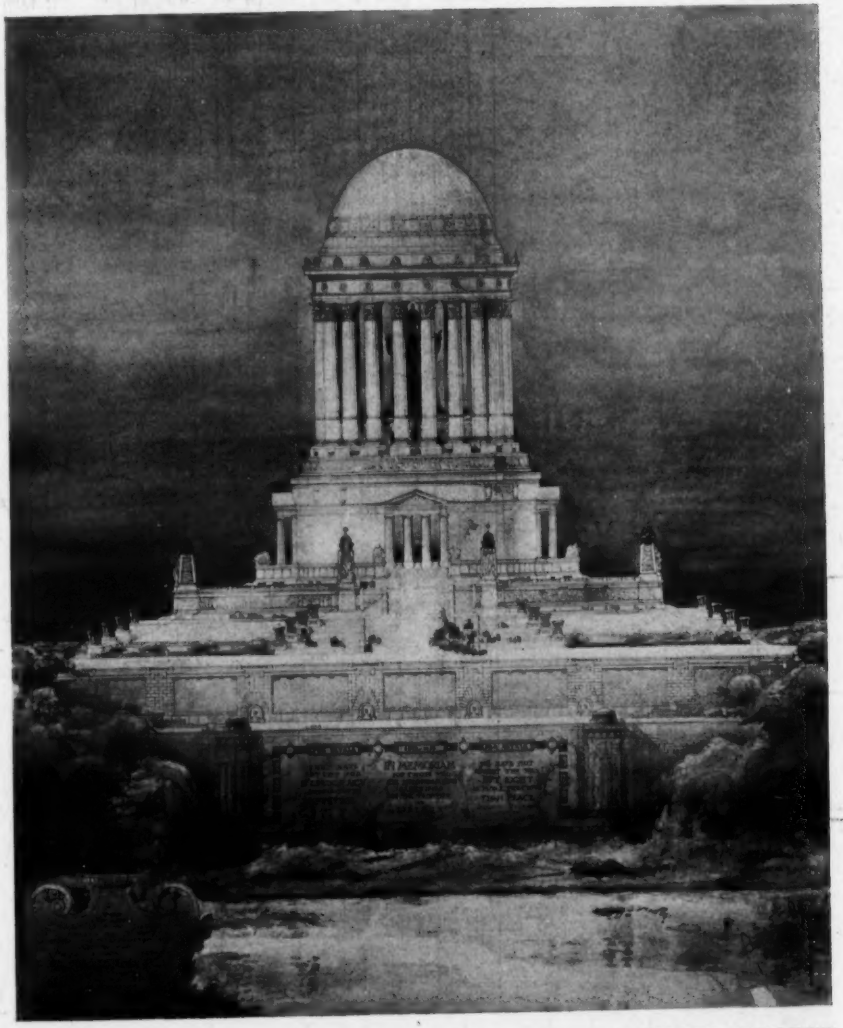
UNIVERSITY OF PENNSYLVANIA AND SAN FRANCISCO ARCHITECTURAL CLUB.

PLACED THIRD (2d Medal).

FINAL COMPETITION FOR THIRTEENTH PARIS PRIZE, SOCIETY OF BEAUX ARTS ARCHITECTS

E. R. PURVES UNIVERSITY OF PENNSYLVANIA

PLACED FOURTH (2d Medal).



W. F. McCAUGHEY, Jr. UNIVERSITY OF ILLINOIS

PLACED FIFTH (2d Medal).

FINAL COMPETITION FOR THIRTEENTH PARIS PRIZE, SOCIETY OF BEAUX ARTS ARCHITECTS.

Beaux-Arts Institute of Design

DIRECTOR OF THE INSTITUTE, LLOYD WARREN
ARCHITECTURE, WILLIAM F. LAMB — SCULPTURE, JOHN GREGORY
MURAL PAINTING, ERNEST C. PEIXOTTO — INTERIOR DECORATION, ERNEST F. TYLER

Official Notification of Awards—Judgment of July 13th, 1920

FINAL COMPETITION FOR THE 13th PARIS PRIZE OF THE SOCIETY OF BEAUX-ARTS ARCHITECTS.

PROGRAM

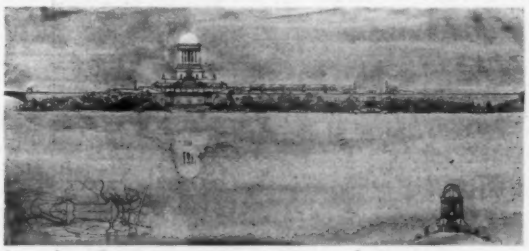
The Paris Prize Committee proposes as subject of this Competition:

"THE GREAT WAR MEMORIAL FOR THE CITY OF NEW YORK."

FOREWORD:

The program is based on the assumption that the City of New York, Metropolis of the Greatest of Free Governments, fully appreciating its privilege and duty, has, for the purpose of creating an enduring Memorial, supreme in conception and in art, and worthy of the City and occasion, secured a commanding site of ample dimension, aspect and prospect; and has by public subscription and enactment, arranged for the necessary funds for a monumental project of the first importance.

The will of the Citizens has been made certain that as regards the Memorial they are to erect, they desire it to be for all time, an emblem, hallowed to the memory of those who were prepared to, and to those who did, make the Supreme Sacrifice in defense of their country and of



W. F. McCAUGHEY, JR., UNIVERSITY OF ILLINOIS
PLACED FIFTH (2ND MEDAL)

the rights and decencies of civilization. To this end they have determined that the Memorial shall in its essential particulars be removed as far as possible from any worldly, utilitarian or commercial nature, and that it shall in its conception, design and execution represent the highest idealism.

The site is so large that certain features of a practical nature are necessary, such as viaducts, approaches, convenience and shelter for crowds who will assemble on occasions of National importance to do honor to their dead. The solemn and dignified character of the Memorial must be clearly expressed in the development of the project and it should not be subordinated to other features of the design.

Architecture, Mistress of the Arts, has been called upon to produce the Great Design, and, as in the past, will call to her aid, her Hand Maidens, Sculpture and Painting.

SITE:

The site determined upon is the northerly end of Manhattan Island, bounded by Dyckman street on the south, the Hudson River on the West, the Spuyten Duyvil Creek on the north and the low-lying land at the base of the cliff on the East. It is a wooded height of rock formation, rising from the river to an extreme height of 230 feet and near the summit is approximately oval. The Western, Northern and Southern sides slope steeply up from the water level, but these may at the option of the competitor be interrupted by a gently sloping shelf constructed at about two-thirds of the way up. The Eastern side, however, is nearly a vertical precipice. North and South of the high ground are valleys running in an East and West direction. Through the North valley a small river flows West into the Hudson; through the South valley Dyckman Street leads to a ferry landing. The far side of these two valleys rise steeply to the level of the shelf above or bridges, over which a Great Highway is to pass at approximately a level of 150 feet above the river.

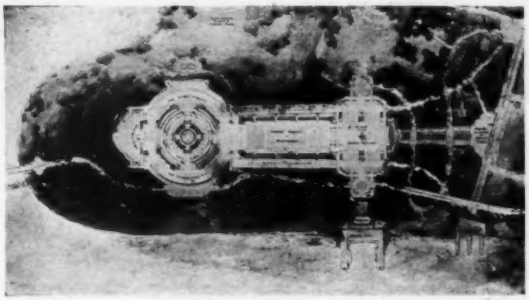
This highway may be developed at its intersection with the easterly or transverse axis of the general plan, if there be one, into a public place arranged in proper relation to the memorial itself.

The memorial should be situated so as to dominate the site, the river and the surrounding city and country.

No restriction is placed on the treatment of the site as regards public place, ramps, stairways, landing stage on the river front, etc., nor is any one of these mandatory; if, however, any or all are introduced into the project the treatment thereof shall be dignified and in a subordinate relationship to the memorial itself. The highway and viaducts, however, are essential features of the problem.

THE MEMORIAL.

The memorial shall be of stone construction, monumental in design and suitably embellished with sculptural and color decoration used with discretion. It may take



W. F. McCAUGHEY, JR., UNIVERSITY OF ILLINOIS
PLACED FIFTH (2ND MEDAL)

any form desired by the competitor, such as a cenotaph (an empty tomb or sculptural monument), a memorial temple, shrine, arch, shaft, tower or other composition.

Provision shall be made for memorial ceremonies, tablets, statues and inscriptions, and the memorial shall be set in an entourage of garden or landscape treatment distinguished by dignity of character.

The site is such that the memorial may be placed so as to be visible for many miles up and down the river, and the eastern face of the cliff is visible from the main line

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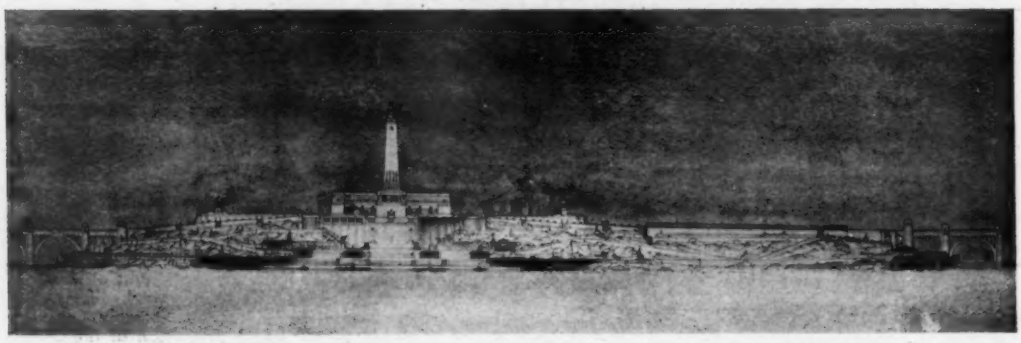


E. R. PURVES — UNIVERSITY OF PENNSYLVANIA

PLACED FOURTH—(2d Medal)

of the railway and the city beyond the low lying ground which is adjacent to the base of the cliff. This basin or low lying ground may be considered as the subject of a city development into a large recreation park, which, together with the site of the memorial itself, is accessible by electric transportation systems and by harbor vessels of all descriptions. A railway freight line operated electrically passes along the west front of the site about five feet above the water level. This may be diverted, tunneled or concealed behind an embankment, or rendered unobjectionable in such manner as the competitor may devise.

JURY OF AWARD:

B. W. Morris, P. A. Cusachs, F. A. Godley, H. R. Sedgwick, R. M. Hood, G. A. Licht, L. G. White, H. Bacon, L. Ayers, and R. H. Dana, Jr., chairman.

NUMBER OF DRAWINGS SUBMITTED: Five.

AWARDS:

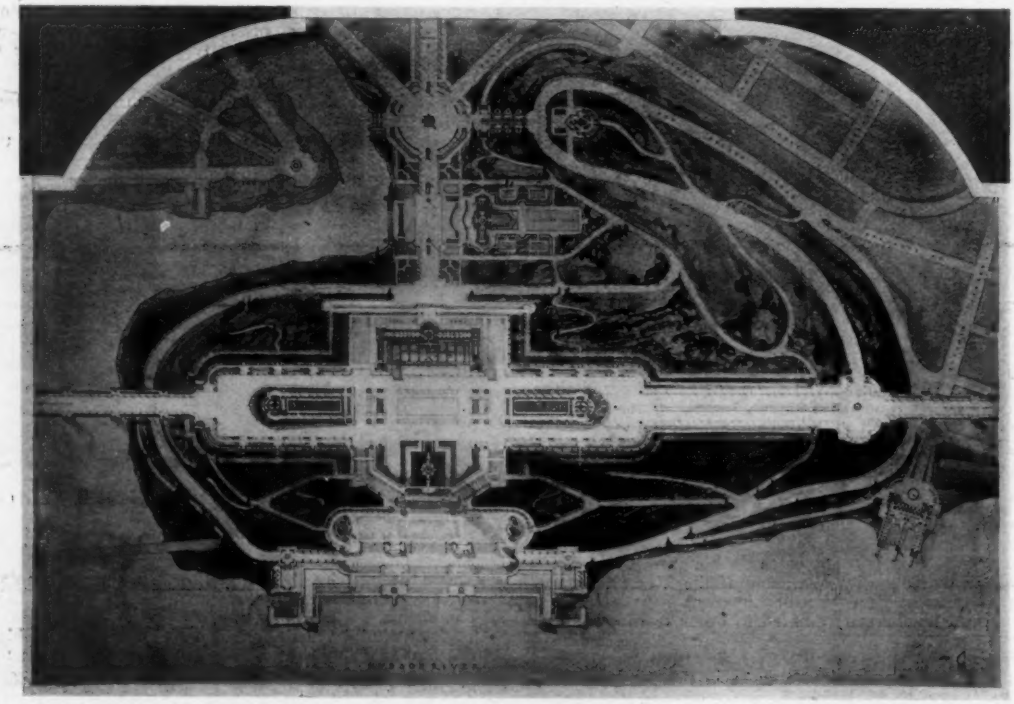
Paris Prize Winner (1st Medal): D. McLachlan, Jr., Atelier Hirons, New York City.

Placed Second (1st Medal): R. S. Simpson, Carnegie Inst. of Technology and Pittsburgh Archtl. Club, Pittsburgh, Pa.

Placed Third (2d Medal): F. A. Chapman, University of Pennsylvania and San Francisco Archtl. Club, San Francisco, Cal.

Placed Fourth (2d Medal): E. R. Purves, University of Pennsylvania, Philadelphia, Pa.

Placed Fifth (2d Medal): W. F. McCaughey, Jr., University of Illinois, Urbana, Ill.



E. R. PURVES — UNIVERSITY OF PENNSYLVANIA

PLACED FOURTH—(2d Medal)

Current News

Happenings and Comments in the Field of Architecture and the Allied Arts

Comprehensive Plan for East St. Louis

An exhaustive plan for a definite scheme of development for the City of East St. Louis, Ill., has been prepared under the direction of the War Civics Committee by Harland Bartholomew, City Plan Engineer.

The features of this plan are presented in a comprehensive report of some seventy-five printed pages. The report is very completely illustrated by specially prepared plans and a large number of photographic illustrations.

East St. Louis finds, as many American cities have found, that the correction of errors due to injudicious early methods is extremely expensive. It is now proposed to take into consideration every feature of the possible growth of East St. Louis and by skillful planning, after exhaustive review and study of conditions, so direct the future growth of the city as to ultimately reach a much desired result.

This report is an extremely valuable one. It not only discusses problems that will particularly refer to the present operations, but it discusses them in a manner that makes the solution of these various problems readily adaptable to other cities where a reconstruction of the city plan is contemplated. The report will be of wide interest and not solely as referring to a specific problem.

Buildings and Lightning Rods

During the recent storms many buildings were "struck by lightning," as the popular phrase has it. Most of them, it would seem, were quite small houses, and hence arises the question whether it is justifiable to leave such buildings so entirely and so generally unprotected as they are. The efficacy of lightning rods in protecting buildings from stroke, by earthing the current received at some high point by a copper conductor, is mainly a theoretic assumption, but the comparative immunity of large buildings that are provided with lightning conductors, and the frequency with which unprotected buildings are struck, are facts that seem conclusive. The frequency and destructiveness of recent thunderstorms suggests the desirability of closer investigation of the subject for the better protection of men and beasts and buildings and trees.

Omaha Architects Plan to Reduce Building Cost

Organization of the "Architects Small House Service Bureau (Inc.) of Nebraska" has been started at a meeting of Omaha architects, realtors and home owners. A system of perfecting standard plans for modest home builders will be adopted, together with professional counsel, working, drawings, details and specifications.

English Names for English Streets

A very just comment appears in the English architectural press on the subject of the futility of expecting accurate pronunciation of foreign names as applied to English streets and other public places. In England, he says, is not Weston-super-Mare pronounced Weston-super-Mayor? And Beaulieu is called Buley. Moreover, he says, Ma-i-da Va-le is pronounced Maidenveil by twelve out of thirteen "of the proletarian class." We never heard it called that, but something just as bad; yet to pronounce it as the correspondent would seem to advocate would be to incur doubts as to one's sanity or good faith. Even a more notorious instance than any of those cited is that of Trafalgar, in which stress is never laid on the last syllable, as the pendants hold that it should be. It is not only with foreign names that we are at fault. Hundreds of English names are maltreated in the same way. Whosoever has not heard Westminister, for example, must lead a cloistered life. In the southerly suburb of Brixton, the inquirer for Robsart street would be met by a vacuous stare, with—from a really intelligent inhabitant—the counter-query whether you meant Robert street.

There would be less need to miscall the streets if they were conspicuously labeled, as, generally speaking, they certainly are not. Now that the omnibus companies are putting up sign-posts and painting the pavements to show where their vehicles stop, the local authorities may chance to regard this enterprise as a reminder of their own neglected duty. As we have said before, every street, court, and alley, in every town, should be conspicuously labeled, with the name well illuminated at night. But it would be weak to stop short at bare necessity. In each instance the name should be accompanied

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by an indication of the run of the house-numbers, and the names of the branch streets right and left of the chief line. And these directions should be architecturally designed.

This point is very well taken. In the large city where there is much transient population, not only are the names of places likely to be abused, but the traveler is at a loss to know where he is. The inconvenience of having to make repeated inquiry makes a bad impression, whereas architecturally designed direction posts, as suggested, would give an air of hospitality and interest that would be appreciated.

National Conference Pledges School Betterment

At national conference on educational campaigns, Washington, June 26, called by Commsisioner of Education Claxton, representatives of 31 national organizations, composed of hundreds of thousands of members, pledged themselves to promote Bureau of Education's national campaign for school betterment throughout the United States. Resolutions adopted by conference urged: (a) Assurance of adequate supply of properly prepared teachers, including greatly extended facilities for this preparation; (b) increased financial support for schools and educational agencies of all kinds; (c) readjustment of educational programs to meet demands of new era.

Enormous Consumption of Lumber Threatens Future Supply

We are consuming lumber three times as fast as we are procuring it. Experts predict our saw log lumber will be gone in fifty years. The bulk of the original supplies of yellow pine in the South will be gone in ten years and within seven years 3,000 manufacturing plants there will go out of existence. White pine in the Lake States is nearing exhaustion and these states are paying $6,000,000 a year in freight bills to import timber. New England, self-supporting in lumber twenty years ago, now has to import one-third of the amount used. It has $300,000,000 invested in wood and forest industries, employing over 90,000 wage earners. Fire destroys over $20,000,000 worth of timber every year and kills the reproduction upon thousands of acres of forest lands.

Construction in China*

All lumber for building in China is bought in the log. As soon as the logs begin to arrive the contractor tackles them with the sawyers. These men are paid piece rates which average about three cash or one-tenth of a cent per square foot of surface sawed. They average a better wage than a carpenter, getting about ten cents a day, as compared with eight cents a day for the carpenter. At this rate they are cheaper than any steam sawmill that can operate in China. In fact, the only reason a sawmill can operate in China at all is because it can produce quickly and with a more even thickness than the native sawyers. The necessary doors, frames and window sashes are all made by hand.

Three Chinese carpenters at eight cents a day with their native tools can accomplish about the same work done by one American carpenter with all equipment. The work is well done if well supervised. The American carpenter has all his wood surfaced, so the Chinese carpenter is at a disadvantage. In comparison, I should say that about five Chinese carpenters at eight cents a day each are necessary to do the work of an American carpenter who receives $6 a day and has all his wood prepared for him.

*From Face to Face With Business in Szechuan, by H. K. Richardson, in *Asia*.

Fuel Saving by Electrifying Railroads

A fuel saving of 122,500,000 tons of coal per year would be effected by the electrification of all of the railroads in the United States, according to a statement of Frank M. Kerr, Montana Power Co., Butte, Mont., in making the report of the Committee on the Electrification of Steam Railroads before the recent annual convention of the National Electric Light Association in Pasadena, Cal. "If all the steam railroads in the country were electrified with power furnished from large steam generating electric stations, the total fuel required would be equivalent to 53,500,000 tons of coal, as against the actual figure for railroad coal used during the year 1918 of 175,000,000 tons."

Alaska Gets First Concrete Building

A reinforced concrete office building will be erected in Ketchikan, Alaska. This will be the first of its kind in Alaska. The structure, for bank and post office purposes, was designed by George W. Lawton and H. Mouldenham, Seattle architects.

Old Field Museum Will Be Wrecked

The old Field Museum in Jackson Park, originally the art gallery of the World's Columbian Exposition and one of the last remaining relics of the 1893 fair, will be wrecked, it was announced by the South Park commissioners. Tennis courts will be laid out on the ground it occupies.

Although efforts have been made to save the building, considered one of the finest pieces of architecture in the country, the commissioners said it would cost several million dollars to make permanent repairs. The moving of exhibits to the new Field Museum in Grant Park has virtually been completed.

Glass Bath in New "Luxury" House

In house fixtures in London a novelty is the glass bath.

It has been introduced here by Paul Poiret, the dress designer, who is going in also for household decoration in order that his gowns might have worthy settings.

Despite many other attempts at the aesthetic bathtub, none have come up to Poiret's for beauty as well as utility.

Many folks seeking domestic luxury in their ablutions, have pounced on the idea of a marble bathtub, only to return a verdict that it was "cold and uncomfortable." Some plutocrats have even gone so far as to use a gold or silver bath, but these have been pronounced bad form, and certainly they haven't been approved very extensively by the "best people."

Poiret would seem to have solved a problem which has baffled many, for his bath is of translucent green, and the walls of its shrine decorated with fishes. A shell acts as light diffuser and there is a sea-foam frieze.

This glass bath is to be the finishing touch to what is already described as the "most colorful house in London."

One Picture Sells at $15,000

Artists exhibiting at the Chicago Art Institute the last year have received encouragement through the museum's delegating one of its staff to stimulate sales. Several pictures sold at $8,000, one at $11,000 and another at $15,000. The total ran into a substantial sum. The man working on sales has an assistant during exhibitions.

"If we don't support the artists we don't have the art," commented this official reviewing results of the last season.

Personals

John J. Donovan, Oakland, Cal., has moved his offices from the Perry Building to the fifth floor of the Pacific Building.

Beverly S. King and Shiras Campbell have removed their offices from 103 Park avenue to 36 W. 40th street, New York.

Willis Polk and R. W. Kinne, Hobart Building, San Francisco, announce that L. Gerstle Mack has become a member of the firm of Willis Polk & Co.

The architectural firm of Ashton & Huntress, 477 Essex street, Lawrence, Mass., is now Ashton, Huntress & Allen, with offices at the same address.

Stork & Knappe, architects, formerly at Palisades, N. J., have moved their office to Ardsley, N. Y.

Joseph J. Galizia, architect, formerly at 2845 West Twenty-third street, Coney Island, has moved his office to 2930 West Nineteenth street.

Kallich & Subkis, architects, formerly located at 2208 Bath avenue, have moved their offices to 7922 Twenty-first avenue, Brooklyn.

Martyn N. Weinstein, architect, formerly located at 1270 Fifty-fourth street, has recently moved his office to 16 Court street, Brooklyn.

Frank Newman and Norman McGlashan, architects, have become associated for the practice of their profession and have established offices at 120 East Fortieth street.

H. C. Meyer, architect, 357 Flatbush avenue, Brooklyn, has formed a partnership with Joseph Mathieu, under the firm name of Meyers & Mathieu, for the general practice of their profession, with offices at the old address.

Thompson & Mellema, architects and engineers, formerly at 640 Broadway, Manhattan, have dissolved partnership. Missac Thompson, of this firm, has recently established an office at 189 Montague street, Brooklyn, where he will carry on his practice as architect and engineer.

Mahan & Broadwell, of Memphis, Tenn., have opened offices in Greenwood, Miss., with H. B. Hammond associated. Catalogues requested.

A. L. Thayer, New Castle, Pa., and R. M. Johnson, formerly with Walker & Weeks, Cleveland, are associated for architectural practice. Offices at 5716 Euclid Ave., Cleveland, and New Castle, Pa.

XUM

Housing Brevities

Overcrowding

The Duluth News-Tribune recently made a survey of housing conditions in Northern Minnesota and Wisconsin towns. The result in most cases show serious overcrowding, though it must be admitted that it does not in any instance equal the serious overcrowding reported in an Eastern one-room cottage, where, rumor said, the family living in the center of the room moved out without waiting for the end of the month because the children quarreled with the children of the family living in the northeast corner of the room.

Houseboat on Land

The housing shortage in Cincinnati is presenting some unique problems to the building commissioner, George Hauser. The owner of a houseboat on the Ohio river asked permission to transfer the cabin of his boat to a foundation which he has prepared on Southside avenue. In the summer he plans to restore it to the boat, thus using the cabin as an all-year-round home. The purchaser of a number of discarded cottages built for the government nitrate plant at Ancor, near Cincinnati, has applied for a permit to bring them into the city and erect them into flat buildings by arranging them three on top of each other. He contends that this can be done with safety and convenience.

New York's Rent Laws Ineffective

The new state rent laws are ineffective and have not deterred profiteering landlords from continuing rent-gouging assaults on thousands of tenants in New York City, according to Leo Kenneth Mayer, chief counsel for the Mayor's Committee on Rent Profiteering. The landlords are adopting divers methods to circumvent the new laws, Mr. Mayer declared, and have been successful to a certain extent.

The Rent Committee, which has been in operation for fifteen months, has handled more than 80,000 cases, of which 62,000 have been settled in and out of court. Of the remaining cases 8,000 are listed as hopeless and no settlement is possible. There is a constant flood of complaints into the committee's office, which is visited by about 5,000 tenants every week.

News from Various Sources

Reclamation Service issues summary of work to December 31, 1919. Shows that projects now under way or completed embrace approximately 3,200,000 acres of irrigable land divided into about 67,500 farms of from 10 to 160 acres each. During the year water was available from Government ditches for 1,935,278 acres on 41,836 farms, and Government was under contract to supply water to approximately 1,690,000 acres. Available reservoir capacity at this time was approximately 9,432,000 acre-feet.

* * *

Galveston, Texas, has adopted a rat-proofing ordinance which is applicable to all classes of buildings in the city, on the recommendation of Dr. J. Holmes Smith, Jr., of the U. S. Public Health Service, and Dr. C. W. Goddard, State Health Officer. The complete ordinance may be read in the Galveston Tribune of July 10.

* * *

A new town is to be built at Dagenham, Essex, by the London County Council, in order to overcome the dearth of houses. Accommodation will be provided for 120,000 people on a 3,000-acre site at a cost of $150,000,000.

* * *

Preliminary investigations by experts of Senate Committee on Reconstruction are developing that lack of transportation may postpone any relief for housing shortage during present year. The coal shortage, one of the causes of recent freight embargoes, is reported due partly to abnormal exportation of coal. Coastwise shipments are inadequate to relieve railroad congestion, it is said.

* * *

Dispatch from Pittsburgh states that conditions affecting iron and steel trade have grown worse on the whole and June, despite efforts of railroads, closed with greater accumulation of material in mill yards and with large number of plants closed. Production was maintained in excess of May and not far from rate of last March.

* * *

Henry H. Curran, President of the Borough of Manhattan, suggests that Governor Smith call a special session of the Legislature this summer to consider measures for the relief of the housing situation in New York City. Mr. Curran practically wants the Legislature to take steps to amend the State Constitution in such a way as to give the city power to utilize its own land in the construction of municipal apartment houses to be rented to families.

Weekly Review of the Construction Field

With Reports of Special Correspondents in Prominent Regional Centers

Cement has been one of the few materials which contractors felt reasonably sure of obtaining, it has accordingly felt an increasing demand and the supplies carried on hand have diminished much below normal. It is stated that in the Lehigh and Hudson districts the plants are now suffering an enforced shut-down for lack of raw materials. The price of this material has recently been advanced 30 cents a barrel in New York.

Another of the more available materials has been lumber which in the early summer fell a little in price. The market now shows evidence of stiffening. Although, however, the production of this material has been somewhat reduced, running according to some opinions 25 to 30 per cent. below normal, the bullish arguments are chiefly those of transportation.

Steel production goes on, suffering only the slight diminution which comes because of the congestion of the plants. The demand for structurals is falling off slightly but prices are well sustained as no manufacturer has as yet to go out for business. In fact, some authorities believe that indications point to still higher prices.

(By Special Correspondence to The American Architect.)

Chicago.—Chicago building and material interests, which had hoped for a modification of the open car order in their favor, as a result of the hearing before the Interstate Commerce Commission were greatly disappointed when it became known the priority order affecting coal had been extended until August 20 as the railroads requested. In the opinion of many dealers the retaining of open cars for coal only will prove disastrous to the whole construction field which is already in a chaotic state. Some go so far as to predict the cessation of all activity in every phase of the construction industry within the next sixty days. Others are looking forward with renewed hope to the hearings which the United States Senate Committee on Reconstruction and Production plans to hold in the next two or three weeks. The committee will investigate construction conditions in the central west.

In the meantime, however, materials are almost impossible to obtain, and when received prove to be of inferior grade. Sand and gravel, two of the most important basic materials used in the construction of both roads and building, are especially difficult to get. Prices continue to advance. Sand is now costing $4 per square yard. Dealers handling a well known brand of cement were notified the price had advanced to $3.99 per barrel wholesale—a raise of fifty cents within a week. This same product had retailed recently at $3.85 per barrel.

Shipments of cement to Chicago have been exceedingly low and most of the cement used recently had been hauled by truck from Indiana. Even this source may soon be cut off as it is claimed the heavy truck loads are tearing up the roads and villages and towns along the route are protesting against further use of the roads for this purpose.

(By Special Correspondence to The American Architect.)

Seattle.—Outstanding features for the steel and vitroware markets of the Pacific Coast this week was decrease in the delivery of nails with further extensions of the rationing system, firm but unchanged prices, more offerings of building paper, plaster board and patent roofing and a coming advance in fire brick of $5 per ton. Common dimension fir lumber is $1 higher due to the inability of the mills to get cars for loading.

Eastern mills are reporting to Pacific Coast jobbers this week that conditions are easier there as to production, but the railways are unable to carry out the feeling as to the car supply. Steel pipe used in essential building projects is scarce, with one-half and three-fourths sizes so short that rationing has been resorted to.

There has been a noticeable improvement in the loading of steel at eastern points by "outside" mills whenever jobbers expressed a willingness to pay a premium over the market. Several jobbers frankly stated that the more that is paid, the quicker the delivery. As the situation is now looked upon by the heaviest jobbing interests of the Pacific Coast there will be little improvement inside of 90 days. There is a limited acceptance by the eastern mills of business for the third quarter but the railway delivery situation promised to become more complicated in the announcement that it is proposed to move the Middle Western wheat through the North Pacific ports to Europe and reload the cars eastbound with lumber for the Central and Seaboard building trade. This would, as jobbers see it, withdraw cars from steel and merchandise service until such time as the bulk of the wheat had been moved.

Vitroware and earthenware are very scarce and none of the Pacific Coast cities have any supply

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ahead. Manufacturers are able to make delivery of about 33 1/3 per cent. of requirements. Shipments ordered early in January are just now being unloaded at Pacific Coast points. To all the pleas for more, manufacturers say the railways and not themselves are defaulting. Crane & Co. received four carloads at their Seattle base this week. Manufacturers are willing to say at this time that they are rapidly catching up and may be able to promise normal delivery within sixty days if they can get cars. The demand for vitroware and earthenware is increasing.

Cast iron boilers, 48 inch, for low pressure heating plants have advanced 5 per cent. this week. There have heretofore been slight advances which the jobbers were able to absorb and to check the rise at the warehouse.

While the market has remained stationary in building paper, cement and plaster board, there are too many offerings for absorption by the jobbing trade during a period of what seems to be reaction in building as in extravagance. Jobbers have in consequence been looking for a decline. Owing to some opportune pickups, the North Coast jobbing trade has been able to get a fair supply of cement, but there is a critical scarcity all along the Coast as in the East as reflected in reports to the West Coast lumber trade from eastern lumber buyers. These buyers, who had been expecting a continued bear market in lumber, say they would buy if they could get cement—both commodities seem to be linked up in an uncommon fashion this season. Difficulty of financing cement stocks for future month delivery is preventing moderate sized jobbers from laying in a supply. Stocks of not less than $40,000 to $50,000 will equip a corporation in this territory to go into competition for the cement business.

San Francisco is buying fir lumber and shingles on the West Coast market. There is great delay in getting white cement from York, Pa. Orders placed in March have been shipped but the cars have been lost.

Red cedar shingles are stronger due to the car scarcity at $4.85 for clears and $4.20 to $4.25 for stars—mill basis.

(By Special Correspondence to The American Architect.)

Boston.—The report that the Association of Railway Executives is attempting to increase the rate of freight car travel to thirty miles per car per day in solution of the car shortage is encouraging both to shippers and users of building materials. During the war, when the Government had at its command all the labor that it needed, had the authority and the right of way everywhere, it got up a speed of 26.01 miles per day.

The western transcontinental lines have an enormous movement, running as high as 60 miles per day, because of their long distances. Now England, on the other hand, is virtually a terminal yard in which movement is impeded by short runs and switching and by frequent congestion. The average movement here is only in the vicinity of 18 miles per day.

A large quantity of lath is now noticed on the sidings in Maine. The mills have been handicapped because of poor shipping conditions, but are now daily receiving additional supplies of empty cars. Prices are more steady in lumber and brick, and although cement mills report plentiful supplies on hand it is still scarce at the job.

One large lumber company reports as follows: with the non-delivery of lumber, caused by the railroad strike, practically every lumber dealer in the country has been forced to extend his financial resources to the limit. It is impossible in many localities to collect for lumber until after it has reached destination, thus doubling the financial responsibility of the shipper. Within the last thirty days there has been a material reduction in lumber prices, but these will strengthen the minute we have a little reaction. A great many commodities are now being sold at less than the actual cost of production, caused largely by the indiscriminate use of the transit car privilege.

New England should spend $365,000,000 to relieve the housing shortage so the City Planning Board reported this past week to the mayor. This report which is the result of a six weeks' survey, points out that 6,546 Boston families now have their furniture in storage, having apparently "doubled up" with their relatives or gone to lodging houses or hotels to live; and that fully 20,000 of the 39,395 industrial employes who were accounted for in the survey complained they were affected by the housing shortage. The Board received reports of conditions from 89 industrial plants employing 28,978 men and 10,357 women of whom 80 per cent. live within the city limits. Fifty-one employers stated that there were indications that many of their employes desired to purchase their homes on a monthly payment plan. Nine of them submitted figures showing that 700 of their employes had expressed a desire to become home owners at once.

Statistics of building and engineering operations in New England show that contracts awarded from January 1 to July 15, 1920, amounted to $193,683,000 as compared with $97,739,000 for a corresponding period in 1919; $78,742,000 in 1918; $111,064,000 in 1917; $110,141,000 in 1916; and $93,152,000 in 1915.

Observations on the Southern California Earthquake

By W. H. Boughton

While earthquakes are far from welcome, they present an opportunity to study the manner in which different types of construction are affected, and from this viewpoint they present an educational advantage. Much has been learned from such catastrophes as the Baltimore fire, and the San Francisco earthquake and fire. There recently occurred in Southern California an earthquake, the effects of which, given below, are worthy of more than passing notice.

History

On June 21, 1920, at 6:47 P. M. the first shock was felt. This was rapidly followed by a longer and more severe one. The direction of the initial tremor was from approximately East to West while the second one passed from North to South. These shocks were felt as far north as Ventura and as far inland as San Bernardino down through the Imperial Valley and south to San Diego. All of the places within this circle felt the shock, more or less. In some places as many as six distinct shocks were felt, although the heaviest shocks were centralized around the town of Inglewood and Hyde Park, where the greatest damage was done.

FIRST NATIONAL BANK BUILDING, INGLEWOOD, CAL.

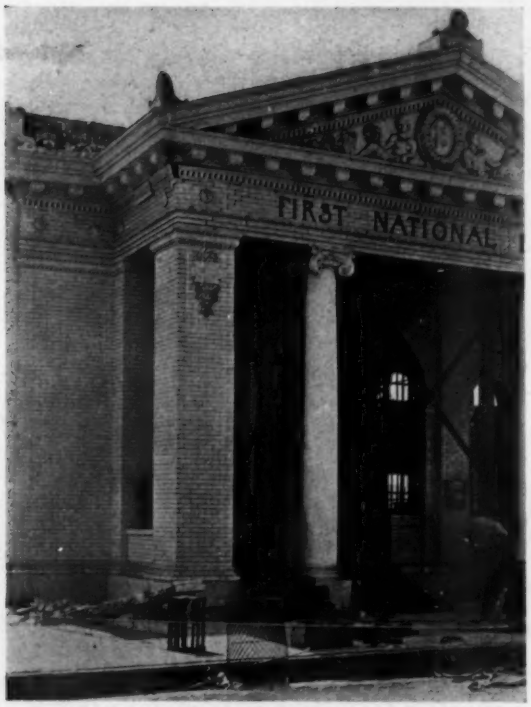
Fronts of buildings were thrown into the street, telephone and electric power service was completely cut off, water mains were broken and all public service generally demoralized.

These shocks were followed by intermittent tremors during the night and a quite severe shock occurred about noon of the day following, June 22.

Scientists who have investigated the phenomena of earthquakes offer the opinion that the disturbances which occurred during these two days resulted from a slipping of the strata in the principal geological fault which follows the coastal range from a point 200 miles north of San Francisco to the Gulf of Lower California.

This fault reaches to a point 100 miles below San Francisco where it swerves twenty miles to the interior and reaches the Imperial Valley by traversing Los Angeles, Riverside and San Diego counties. There are at least three such geological faults in the state, two of which are in the north.

At Santa Monica the shock was severe enough to rock the walls of houses and sway trees and telephone and electric light wires. The writer was in the kitchen of his bungalow at the time, with his wife and son, and the only description that can be given is likened to a steamer which is going full speed ahead when suddenly the engines are reversed



VIEW SHOWING SHORING OF PORTICO OF FIRST NATIONAL BANK BUILDING.

full speed astern, causing the walls and floors to heave and rock with apparent intentions of collapsing. This being our first earthquake experience, we were too astonished to do more than sit and watch things rock and, after it was over, rush out into the yard, carrying with us the things that were in our hands at the time.

Results of Investigations

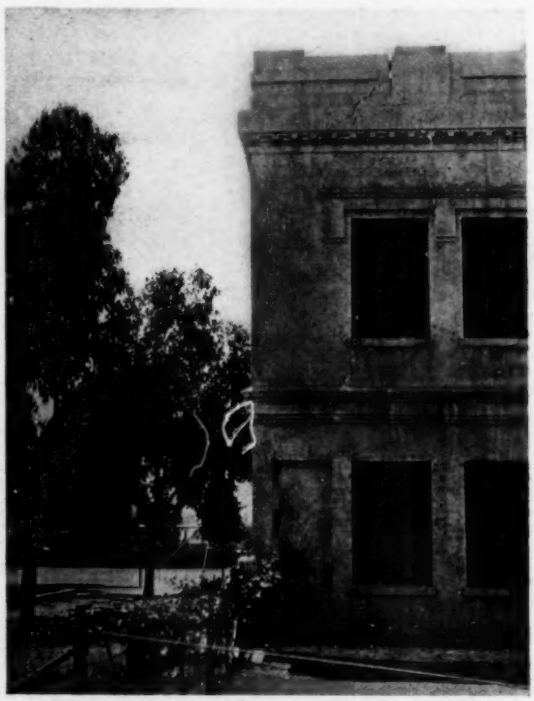
TUESDAY morning, June 22, I started out by automobile to visit all of the places where the shocks were reported and where any damage was done, in order to find out how serious had been the damages. I finally decided to confine my efforts in and around the center of the damaged area which was the town of Inglewood. Here the damage was very severe.

The front of the Hotel Inglewood, a two-story brick and frame building with wood floor joists and plastered ceilings on wood lath, was out in the street, exposing the front bed rooms to view, while the plastered ceilings had fallen to the floor. The brick front wall in being thrown into the street, crushed a Ford car that was parked in front of the hotel. Little or no plastered work was left intact.

The Inglewood sub-station of the Southern California Edison Company, a two-story brick structure was badly wrecked, most of the front wall having been thrown into the street. The ceilings were plastered on wood lath and large sections of the plaster had fallen.

The First National Bank Building, a comparatively new one-story structure with brick walls faced with enameled brick and terra cotta trim, was badly damaged above the cornice line and the walls cracked at the corners. The damage was considered sufficiently dangerous to warrant shoring up the walls over the main entrance. An inspection of the interior revealed that the exterior walls were furred with hollow tile on which the interior plastering was applied. These walls were cracked in many places, and much of the plaster loosened and tore away from the base. The ceiling was a suspended ceiling of metal lath and, aside from the cracks around the angles of the walls, no cracks were visible.

The main building of the grammar school, erected in 1910 at a cost $75,000, was constructed with brick walls, stuccoed on the exterior and lined with hollow tile. The ceilings were of plaster on metal lath. The accompanying photographs will show the character of this building, also the present condition of the exterior. It was not possible to get into the interior as the walls were in danger of collapsing under the slightest additional shock. The one-story buildings or annex shown in one of the

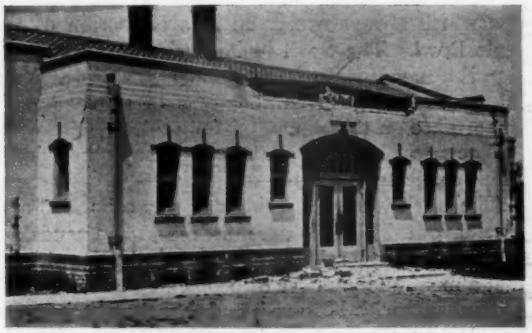


CORNER OF THE MAIN BUILDING, INGLEWOOD GRAMMAR SCHOOL.

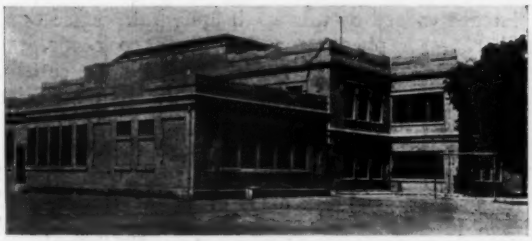
photographs were erected in 1915 and 1919, and are constructed with walls of wood stud, lathed on both sides with metal lath, stuccoed on the exterior and plastered with hard wall plaster inside. On the top floor, over the central section of the

HOTEL INGLEWOOD AT REAR.
Front wall entirely out.

building was located the auditorium. This portion of the structure fell clear through to the first floor, while the supporting walls were thrust sideways, leaving this section of the building a complete wreck. From present indications the main building will have to be torn down and rebuilt. The local authorities who had made an inspection of the interior reported that the plastered walls were badly cracked, even the blackboards backing up on the hollow tile being stripped clean. Floors lathed on the underside with metal lath, were reported to be in good condition, excepting where the floors



SCHOOL AT HYDE PARK, CAL.



INGLEWOOD GRAMMAR SCHOOL.
One-Story Annex in the foreground is practically undamaged.

fell through. The annexes were open for inspection and these buildings were remarkably free from cracking, either on the exterior or interior.

It was impossible to find much left in the way of chimneys in Inglewood, Hyde Park or Angeles

SOUTHERN CALIFORNIA EDISON BUILDING, INGLEWOOD, CAL.

Mesa. At Inglewood, the fire apparatus was parked in the street, as the engine house will have to be torn down and rebuilt. This structure is a brick-stucco building, and the stucco has cracked and fallen.

The accompanying illustrations indicate, better than a written description can, the nature of the

ANOTHER VIEW OF THE HYDE PARK SCHOOL.

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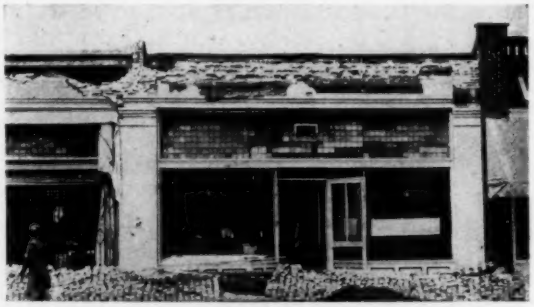
damage caused by this earth upheaval. In sections where such phenomena are likely to occur, the forms of construction adopted should be capable of resisting, to some extent at least, the strains thus induced, without causing the collapse of the structure or any extensive damage thereto. It is believed that a system of construction which will fulfil these requirements can be developed, and should meet with approval by the architectural profession.

In working along this line it is necessary constantly to bear in mind the fact that whatever construction is employed it should be fire-resisting, since fire is quite likely to result as an aftermath of an earthquake. By eliminating as much as possible, materials that present a fire hazard the total damage will be kept at a minimum, which is the object sought.



A STORE AT INGLEWOOD, CAL.

Report on Trip to Princeton, College of City of New York, Yale and Harvard for the Purpose of Inspecting the Stadia at those Universities

By HOWARD DWIGHT SMITH

Part III

THERE is something distinctive about the name "Yale Bowl." The effectiveness of the structure in seating a large number of people in comparatively close proximity to a playing field justifies that distinction.

An inspection of the Yale Bowl was made on Tuesday, May 11, and certain observations noted before an interview was obtained with Dr. Al. Sharpe, Director of Athletics at the University. As the interview with Dr. Sharpe dealt more with the effectiveness of the structure in fulfilling the requirements for which it was built than it dealt with the physical condition of the work or its engineering features, it may be well to treat that part of the discussion first.

The Yale Bowl is located at the edge of the City of New Haven with the rest of the athletic plant, quite some distance from the academic and social activities of the University. This is a condition with which quite a number of large institutions have to contend, especially with the growing tendency toward participation in so-called "mass athletics." At New Haven it is necessary to go by street car or motor to reach Yale Field from the campus. Dr. Sharpe deplored this fact quite as much as he did the fact that it is quite impossible for him to have his football candidates' fall schedules so arranged that they may have no classes in the afternoon, and their morning academic work arranged so as to leave their nights for rest rather than study.

The entire athletic plant at Yale Field is quite extensive. The Bowl is only a single feature of the entire group, and while it is enormous in size, still it is perhaps the least used of the entire group. There is a separate Varsity diamond with grandstand and bleachers, several class diamonds and a running track entirely separate from the other features. There is a new armory for the artillery unit (R. O. T. C.) and a large number of tennis courts. A large new Club house, proposed in 1915 but withheld from construction during the war will add greatly to the efficiency and convenience of the athletic group.

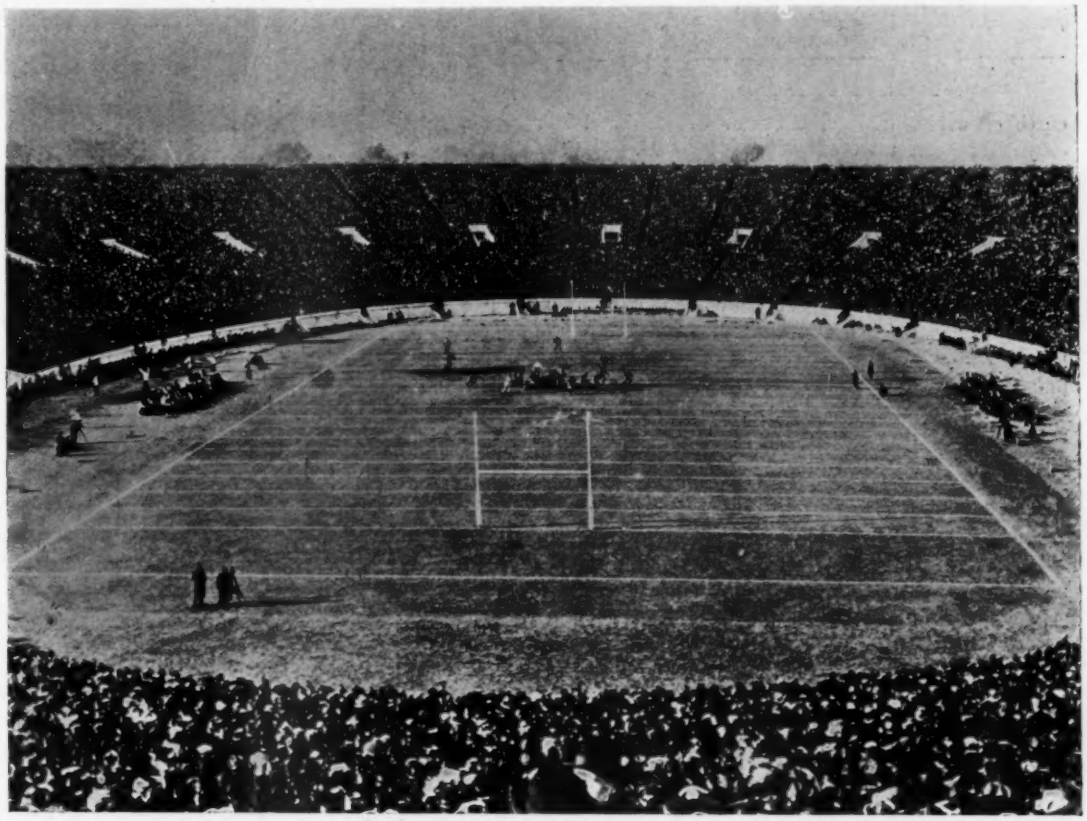
One of the first things Dr. Sharpe mentioned in his interview was with reference to the use of such a large structure as the Yale Bowl for so few events. This, of course, is a very pertinent question and one which always comes up in a discussion of the Yale Bowl. The Bowl in its design and construction is a monument to that wonderful spirit of Yale Alumni, which has traditionally come to place more importance on the climax of fall athletics, the football game with Harvard, than upon any other single thing connected with the institution.

The spirit with which the idea was conceived and carried out by the alumni is most commendable. The whole and sole idea back of the Bowl was that a maximum number of people be accommodated at the game with Harvard, and that they be accomodated as conveniently and practically as possible, in the most economical way. This has been accom-

plished and the Bowl is a success from that point of view. Its builders and patrons are interested in one day out of 365 and are willing that a large part of their investment lie idle the other 364 days. Thus are the strong ties of Alma Mater evidenced.

It is easy to see, therefore, how the size and shape of the Bowl was determined. A gridiron was laid out and a minimum distance from the corners to the inner wall was fixed upon by the Athletic Mentors. Through four points thus determined an approximate ellipse was described which forms the inner perimeter of the seating structure, placing the first row of spectators, as near the gridiron as possible, this being one of the prime considerations. The length of this internal perimeter is, therefore, considerably less than a quarter of a mile and the placing of a regulation running track within it became impossible, even if there had been sufficient space to pass the corners of the gridiron. Straightaway tracks also being impossible, it is evident that as far as the track team is concerned, the Yale Bowl is of little or no use.

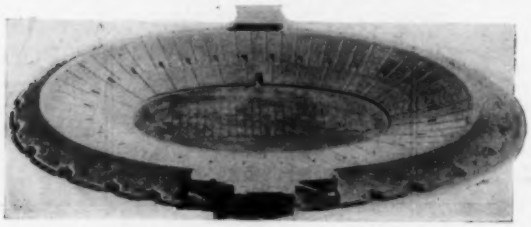
Bearing in mind the ideas of the original donors of the Bowl, this is not a disadvantage. Any additional use which may be made of it may be considered as extra efficiency. Dr. Sharpe informs us that he proposes using the field for La Crosse in winter and spring when the playing surface will permit. During the last football season (fall of 1919) excessive rains and the wear of hard playing, left the turf in bad condition. Resodding of large portions of the playing field during the spring has precluded its use for La Crosse for the current season.



THE YALE BOWL, NEW HAVEN, CONN.
DONN BARBER, *ARCHITECT.*
View looking toward the narrow end of the eliptical field.

The general scheme of building the Bowl has been so often described that it is hardly necessary to go into detail here. The earth was scooped from the central portions and banked up around the outside, placing the lower half of the seat section on solid ground and the upper half on excavated ground. The playing field is about 25 feet below the level of the surrounding ground and the top row of seats is about the same distance above it. This makes the top row of seats some 50

feet above the level of the playing field. The lower half of the seating section has been built permanently of concrete, but the upper half of the seating section, that which rests on the bank filled with the



MODEL OF THE YALE BOWL.

earth excavated from the center of the bowl has only been built up temporarily of wood. Of the structural properties of these concrete seats, more will be said later, but it might be mentioned here that the greatest part of Yale's problem is ahead of it. The sandy nature of the soil has been quite an advantage for good drainage of the field itself, but as for being good for bank fill this sandy soil leaves much to be desired. It doesn't seem to settle properly and it will not "stay put." One of the greatest problems of maintenance is to keep the sand from the upper filled bank from washing down and filling up lower portions of the concrete seats and drains. Fill of this nature will be hard to build additional concrete seats on.

The ellipse of the top row of seats is about 150 feet outside of the perimeter of the inner wall. The idea has often been expressed that it might be necessary for spectators on the top seats to use binoculars to see the game. Perhaps this feeling is due from the impression obtained from photographs. The peculiar size and shape of the Bowl make it impossible for any photograph, save an airplane view to convey the real idea. This feeling does not come to one who visits the structure when it is empty. Perhaps the vastness of the Bowl is more apparent and more impressive when it is filled to capacity, but the perimeter of the inside wall of the Bowl has been made so small that the fartherest row of seats at the end of the ellipse is not more than 400 feet from the actual center of the playing field.

Entrance to the Bowl is effected through a single row of thirty-two tunnels each of which leads from the outside ground level through the upper bank fill to an eye or a portal. These portals take care of the crowd quite satisfactorily. It has been found necessary to fence off the area surrounding the bowl with a high fence in order better to control the crowds. The business manager of the Athletic Association, Mr. Woodstock, assures us that the handling of the crowds at the Bowl itself is quite satisfactory, because seats are easily found from these portals or eyes which are about midway of the seating section. The greatest difficulty seems to be to get the crowds distributed as much as possible at some distance from the structure itself, in order to avoid congestion at few points.

Casual visitors are admitted to inspect the Bowl daily from 9 to 5. One gate in the outside wire fence is left open and one of the tunnel entrances to the Bowl itself is left open. No attendants are

THE YALE BOWL AS IT APPEARED

Over 61,000 persons are comfortably seated, each possessing an unobstructed view of the field.

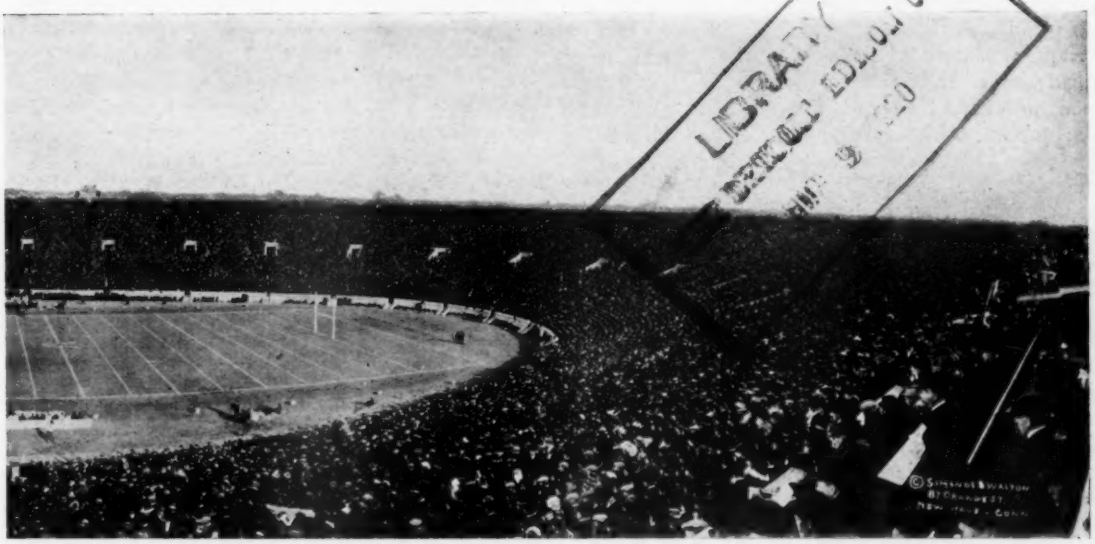
left in charge and all parts of the structure are open to inspection.

The top part of the exterior slope of the filled bank is covered with turf. The lower portion is held up by a retaining wall some 10 feet high, through which the tunnel entrances are cut. In these tunnel entrances it is evident that an attempt has been made to vary the color and texture of the concrete. There is quite an opportunity in using varying textures and colors in stucco, if sufficiently studied to be harmonious. In the case of these tunnel portals, the prevailing pinkish cast of the main portion of the wall does not harmonize too successfully with the dull gray tone of the rough textured portion immediately surrounding each door.

On the inside of the Bowl, the general elliptical line of the inner wall is apparent, but an appearance of crudity in execution is given by the building of the inner wall in straight chords approximately 10 feet in length. This is probably quite an economical method of construction and its use in the layout of the seating tiers is quite commendable from that point of view. The building of the inner wall in circle arcs, however, would have added much by way of an appearance of neatness and thoroughness which would have well been worth what slight additional expenditures it would have necessitated. The heavy coping over the inner wall is of rather ponderous cross section, and does not add to the refinement of line which might have been possible otherwise.

Two peculiar physical characteristics of the Yale Bowl have been noted. Dr. Sharpe points out that in the fall the temperature within the Bowl, down on the playing field particularly, is from five to ten degrees higher than outside. This is due to the air pocket, which the Bowl itself forms within which there is little or no air circulation, and it is seldom that there is much of a breeze down near the field level. The thirty-two horizontal tunnels usually have a distinct outward draft, but they only effect the air down to their own floor levels which are some 25 feet above the playing field. This difference in the temperature is ordinarily found within all closed stadia. In those closed stadia where track work is provided for and straightaways are provided through tunnels under the seats at any one point (as at Syracuse, for instance), there is a decided draft from the inside warmer air to the outside cooler air. This draft moves in the opposite direction to the runners in the dashes and adds greatly to the inconvenience of running. Other inconveniences in running through a tunnel of this nature are sudden change of light, and a sudden change of temperature.

The other peculiar physical characteristic of the Yale Bowl which was particularly noticeable was its acoustics. From any given point at the level of the playing field even the faintest sounds made along the upper row of seats is plainly audible. During the inspection of the Bowl a party of four visitors entered through the open tunnel and portal. This party ascended to the crest of the embankment at the top seat and walked entirely around the ellipse. Every word spoken by the members of the party and even the sounds of their footsteps could be plainly heard from points along the inner



DURING A YALE-HAVARD FOOTBALL GAME.
Thirty-two tunnels give entrance to the bowl. The portals to these tunnels can be clearly seen.

wall, at the playing field level, except for a space of some 90 feet while they were passing outside the temporary press stand on the north. While the party of visitors was walking along the crest behind that stand, there were no sounds of any kind heard. Mention is made here of this phenomenon of acoustics more for its passing interest than for any conclusions or lessons to be drawn from it. The clearness and audibility of sounds when the Bowl is filled to capacity perhaps has little effect upon the crowd itself.

The engineering and structural problems involved in the construction of the Yale Bowl are somewhat different from those of most other structures. A large part of the construction consisted in moving the 175,000 cubic feet of earth from the bottom of the Bowl and placing it to form the surrounding embankment. The concrete work involved (1), the building of the lower tiers of seats, supported directly upon the inner slope of the excavation; (2) the entrance tunnels, which were built in the open and later filled by the embankment; (3) the outside retaining wall to hold the embankment; and (4) the two gate house structures, the larger one on the south, the smaller one on the north.

None of these concrete operations involved the question of vertical support which is found in most structures for the seating of a great number of people. The problems of reinforcing are largely confined to the design of the seat slabs to avoid cracking from unequal support or unequal settlement. It is quite evident that a larger structural problem will present itself to the engineers and builders when it becomes necessary to construct the upper part of the seat section on the sandy fill of the upper embankment.

Expansion and contraction in the seat section already built has been very successfully taken care of in the method of construction. The seats have been cast in position in blocks three steps high and in sections 10 to 16 feet long (depending on the distance from the inside ellipse). These blocks have been separated from each other simply by pieces of tarred felt. Three of these structural section taken together form one seating section extending from tunnel to tunnel. At one of these radial joints between tunnels there has been placed a regular street paving joint which has been filled with an elastic material. There are, therefore, in this lower part of the Bowl a total of thirty-two radial joints especially provided for temperature movement, and most of the advantages of small stone masonry construction have been obtained by the jointing of the structure into integral blocks, none of which is over 120 square feet in horizontal area. The joints about these comparatively small blocks are not designed to take up expansion and contraction, but they do permit a certain amount of flexibility which prevents cracking and consequent disintegration. The condition of the concrete in these seats, after five and one-half years of wear, is nearly perfect. The parapet wall at the inner edge of the seats stands about 4 feet high from the field level and about 30 inches high from the first seating space. This wall is 12 inches thick, much thicker than would ordinarily be necessary, but it is just such excess mass that makes for durability and creates the impression of permanence.

One of the distinctive features of the Yale Bowl is the method of placing wood seats on the stone steps. The depth of the stone steps is not sufficient to provide comfortable seating without raising the actual seating surface. This has been accomplished by securing heavy galvanized iron standards to the front edge of each step by means of bronze U bolts. These galvanized iron standards support wooden seats and back rests built of Douglas fir. These standards are so built as to bring the wood seat always 18 inches above the foot rest of each step.

On the outside retaining wall, sliding expansion joints have been provided at the overlapping pilasters at each of the tunnel entrances. These joints have not been as effective as the plain butt joints of the seat structure. There are a number of instances of spalling off. These spalls appear to be of three kinds; (1) those caused by strains due to pressure of natural expansion or contraction; (2) those caused by frost action; (3) those caused by seepage from within the wall itself. The third kind is only slightly in evidence and may probably be considered as partly affected by the second class. Evidence of disintegration is very small as compared with the magnitude of the structure and the general appearance of the concrete is quite encouraging to those who contemplate its use in such large quantities.

Reference is made to Engineering Record, March 28, 1914, and November 21, 1914, for discussion of the technical features of the Yale Bowl.

To be continued

The Erection, Repair or Demolition of Buildings

Under the above title the New York State Industrial Commission has issued Bulletin No. 23. The rules contained in this Bulletin deal with ladders, scaffolds, runways, derricks, hoisting apparatus, etc., used in connection with the erection, altering and demolition of buildings, as well as with oxy-acetylene welding and cutting. Copies may be had on application to the Bureau of Industrial Code, 124 East Twenty-eighth street, New York City.